CHAPTER 8

Steering and Suspensions

OVERVIEW / SPECIFICATIONS 8.2
INSPECTION 8.2
CAMBER / TOE SPECIFICATIONS 8.2
SPRINGS 8.2
ADJUSTABLE SHOCKS 8.3
FRONT SUSPENSION TYPE BY MODEL 8.3
REAR SUSPENSION TYPE BY MODEL 8.3
SUSPENSION MOUNTING FASTENER TORQUE 8.3
IQ REAR SUSPENSION SHOCK ROD 8.4
IQ REAR TRACK SHOCK PIVOT ORIENTATION 8.4
FRONT SUSPENSION ASSEMBLY ILLUSTRATIONS 8.5
IQ FRONT SUSPENSION 8.5
IQ LWT FRONT SUSPENSION 8.6
IQ FIXED STEERING POST ASSEMBLY 8.7
IQ RIDER SELECT STEERING POST ASSEMBLY 8.8
IQ STEERING LINKAGE 8.9
600 WIDETRAK IQ STEERING ASSEMBLY 8.10
600 WIDETRAK IQ STEERING LINKAGE 8.11
600 WIDETRAK IQ STEERING MOUNT 8.12
HANDLEBAR ASSEMBLIES 8.13
FRONT SWAY BAR ASSEMBLIES 8.14
FRONT SUSPENSION SETTINGS 8.15
OVERVIEW 8.15
ALIGNMENT BAR SPECIFICATIONS 8.15
MAXIMUM WIDTH 8.15
HANDLEBAR CENTERING 8.15
CAMBER 8.16
CAMBER ADJUSTMENT 8.16
TOE ADJUSTMENT 8.17
DISASSEMBLY AND ASSEMBLY 8.18
SPINDLE REMOVAL 8.18
SPINDLE ASSEMBLY 8.18
SPHERICAL BEARING REPLACEMENT 8.18
UPPER / LOWER CONTROL ARM REMOVAL 8.18
UPPER / LOWER CONTROL ARM INSTALLATION 8.18
REAR SUSPENSION ASSEMBLY ILLUSTRATIONS 8.19
REAR SUSPENSION OPERATION 8.52
OPERATION 8.52
WEIGHT TRANSFER 8.52
COUPLING 8.52
REAR SUSPENSION ADJUSTMENTS 8.53
ADJUSTMENT PROCEDURES 8.53
REAR SUSPENSION RIDE HEIGHT 8.53
SCISSOR STOP ADJUSTMENT 8.53
TORSION SPRING ADJUSTMENT 8.54
LIMITER STRAP ADJUSTMENT 8.54
M-10 SUSPENSION 8.55
RAIL SLIDERS 8.57
REAR SUSPENSION REMOVAL AND INSTALLATION 8.58
REMOVAL 8.58
INSTALLATION 8.58

©2010 Polaris Sales Inc.

OVERVIEW / SPECIFICATIONS

Inspection

When inspecting steering and suspension components for wear or damage, always replace parts as necessary. Refer to the assembly exploded views in this chapter for identification of components and torque values of fasteners. Make notes of the direction a bolt goes through a part, what type of nut is used in an application, etc.

Some of the fasteners used in the IFS are special and cannot be purchased at a hardware store. Always use genuine Polaris parts and hardware when replacing front end components. Review steering adjustment guidelines before making adjustments.

The following components must be inspected at this time.

- Tie rods and tie rod ends
- Torsion bar and bushings / linkage (where applicable)
- Handlebars and steering post assembly
- Spindles and bushings
- Skis and skags
- Pitman arms / Idler arms
- A-arms and bushings
- Shock absorbers, shock mounts, springs
- All related fasteners - check torque. Refer to steering exploded views at the beginning of this section.
- Grease all fittings.

Always follow rod end engagement guidelines. Maximum setup width must be checked whenever front suspension components are adjusted or replaced.

Camber / Toe Specifications

Maximum width and camber measurements are to be taken with the front end elevated and shocks at full extension.

Toe alignment is measured at ride height. This means that the machine is on the ground and resting at normal ride height, not full rebound. Measure at a point 10” (2.54cm) forward of the ski mount bolt and 10” (2.54cm) behind the ski mount bolt, preferably on the center line of the carbide skags.

Width is measured from the center of the spindles.

Camber measurement is taken from the top of the alignment bar to the top of the ski mount hole in the spindle with the bushing removed.

Camber & Toe Specifications

SUSPENSION	MAXIMUM SET UP WIDTH in/ cm (± .25in/.6cm)	CAMBER in/mm	TOE OUT (At ride height) in/mm
IQ 42.5	42.5 / 108	2.25 ± .31 57 ± 7.9	0 -.12 0 -3.05
IQ RMK	38.67 / 98.2	2.17 ± .31 55 ± 7.9	

Springs

When the front suspension encounters a bump, the force of the bump compresses the spring. If the bump force is 450 pounds, a 100 #/in. spring will compress 4.5 inches. A 150 #/in. spring will compress 3 inches. If the suspension had 4 inches of spring travel, the 100 #/in. spring would bottom out, while the 150 #/in. spring would have one inch of travel remaining.

- Free length - the length of a coil spring with no load applied to the spring
- Installed length - the length of the spring between the spring retainers. If the installed length of the spring is less than the free length, it will be pre-loaded.
- Spring rate - the amount of force required to compress a coil spring one inch. For example, if 150 pounds of force are required to compress a spring 1 inch, the spring rate would be 150 #/in.
- Straight rate spring - the spring requires the same amount of force to compress the last one inch of travel as the first one inch of travel.
- Progressively wound spring - the rate of the spring increases as it is compressed. For example, a 100/200 #/in. rate spring requires 100 pounds of force to compress the first one inch, but requires 200 additional pounds to compress the last one inch.

©2010 Polaris Sales Inc.

Adjustable Shocks

Snowmobiles equipped with adjustable Ryde FX shocks allow the driver to make adjustments to the compression valving by turning the screw on the shock.

By turning the screw clockwise (a small screwdriver or dime work well), the compression valving is increased, stiffening the ride. To soften the ride, reduce the compression by turning the screw counter-clockwise. A great deal of ride performance is accomplished with a mere 1/2 to 1 turns. There are approximately 3 full turns of adjustment available.

If the suspension is "bottoming", tighten the compression screw clockwise in 1/2 turn increments until the bottoming stops. Backing off 1/4 turn counter-clockwise at this point should give you the best possible ride ensuring use of the full travel of the suspension. The opposite procedure should be used if the suspension is too stiff upon initial set-up.

If bottoming continues after the screw is turned in full clockwise, the compression spring should be adjusted with the threaded adjustment collar. Back the screw out to the original starting position after the compression spring has been adjusted.

Riding conditions are ever changing. Keep in mind the compression damping adjustable screw can be adjusted at any time to achieve the best possible ride in any condition.

NOTE: Install shock so the adjustment screw is facing outwards.

Front Suspension Type by Model

FRONT SUSPENSION	MODELS
IQ 42.5	ALL IQ, IQ Switchback, IQ LX, IQ Assault, IQ Touring, IQ Widetrak Models
IQ RMK	ALL IQ RMK Models

Rear Suspension Type by Model

TYPE	MODEL
IQ 121 IQ 121 LWT	IQ 121 Models
IQ 144 / 155 / 163	2007 IQ Switchback Models IQ RMK Models
IQ 146	IQ Assault RMK
M-10 128	IQ LX Models
M-10 136	2007 600 HO IQ Touring
IQ 136 Coupled	> 2007 IQ Switchbacks
IQ 136 Comfort	> 2007 600 IQ Touring
IQ 156 Widetrak	IQ Widetrak

Suspension Mounting Fastener Torque

COMPONENT	TORQUE SPECIFICATION
Front Suspension Upper / Lower Control Arm-to-Bulkhead Mount Fasteners	40 Ft.Lbs. (54Nm)
IQ 121 / IQ Widetrak FTA / RTA-to-Tunnel Fasteners	60 Ft.Lbs (80Nm)
IQ 144/146/155/163 FTA / RTA-to-Tunnel Fasteners	45 Ft.Lbs. (61Nm)
M-10 128 / 136 FTA / RTA-to-Tunnel Fasteners	70 Ft.Lbs. (95Nm)
IQ 136 Coupled FTA / RTA-to-Tunnel Fasteners	60 Ft.Lbs (80Nm)
IQ 121 LWT FTA RTA	60 Ft.Lbs. (80Nm) 40 Ft.Lbs. (54Nm)

NOTE: FTA = Front Torque Arm / RTA = Rear Torque Arm

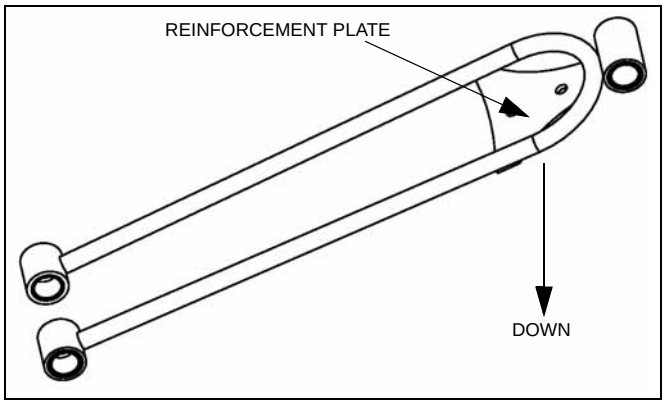
⚠ CAUTION

All torque arm and some rail fasteners are pre-coated with thread locking agent. Always replace with new fasteners.
Never re-use Nylok nuts. Always replace components with new nuts.

©2010 Polaris Sales Inc.

IQ Rear Suspension Shock Rod

Orientate the shock rod with the reinforcement plate facing down.

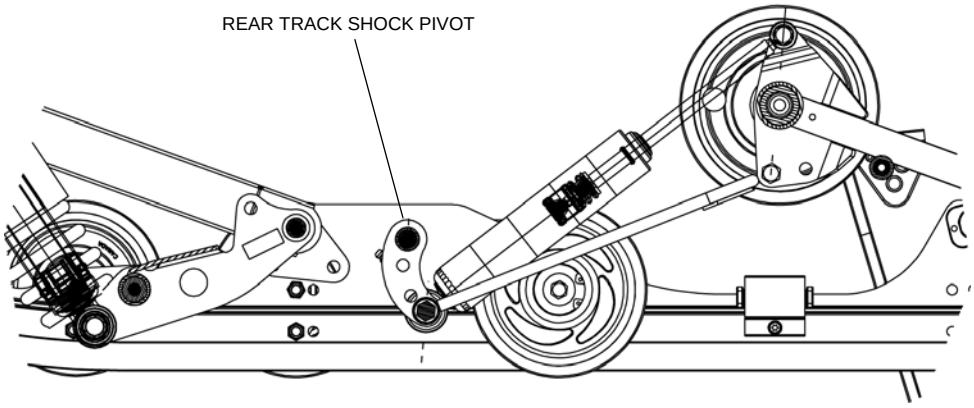


IQ Rear Track Shock Pivot Orientation

The rear track shock pivot must be properly located on all IQ rear suspensions when installing the rear skid into the tunnel. Failure to properly locate the rear track shock pivot may cause the rear torque arm to lock.

All IQ rear track shock pivots, with the exception of IQ RMK, Widetrak, and race suspensions, must be located as shown below. On IQ RMK, Widetrak, and race rear suspensions, the shock pivot is orientated upwards.

Always verify the rear torque arm scissor is pushed forward so that it is either straight up (IQ RMK, IQ Widetrak, IQ Shift) or against the FRSS (IQ 121, IQ 136 Coupled, IQ Comfort) and not collapsed rearward when installing the rear skid assembly.

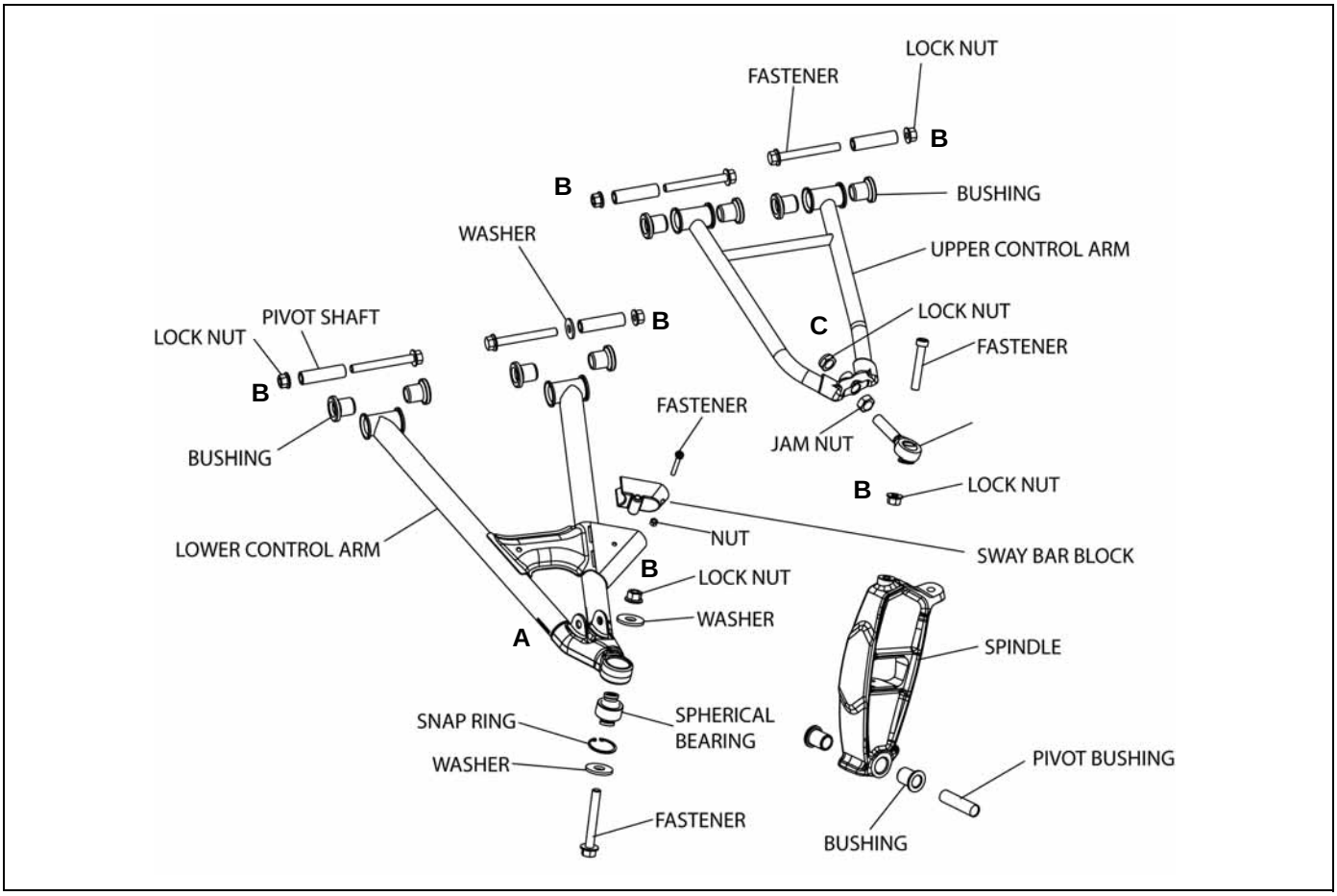


IQ 136 COMFORT REAR SUSPENSION

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

FRONT SUSPENSION ASSEMBLY ILLUSTRATIONS

IQ Front Suspension



CAUTION

Never re-use lock nuts. Always re-assemble using new lock nuts.

= T

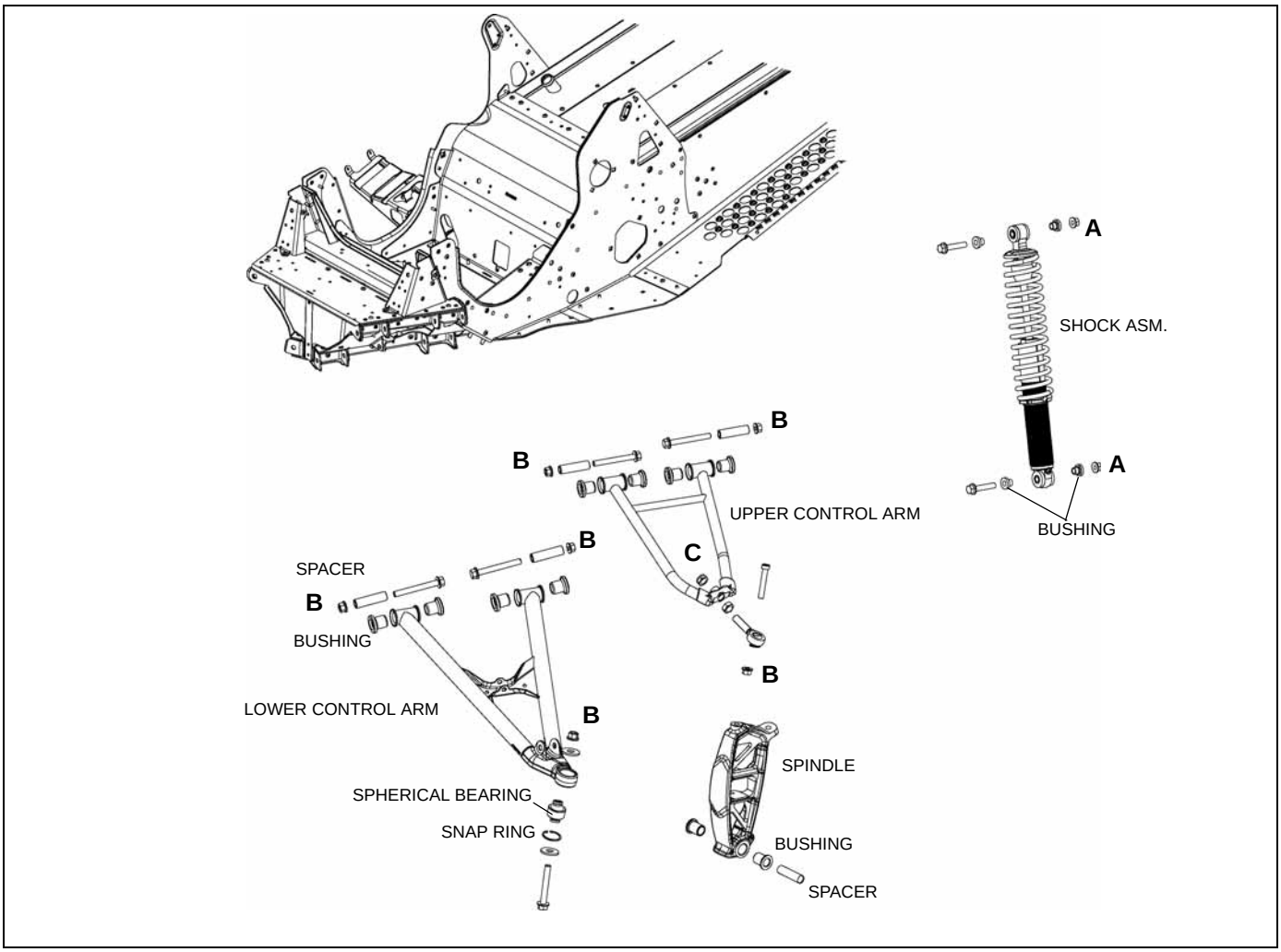
A = 29 Ft.Lb. (39 Nm) (Shock Mounting Fastener Nuts)
B = 40 Ft.Lb. (54 Nm)
C = 45 Ft.Lb. (61 Nm)
Sway Bar Block Fastener Nuts = Hand Tight

NOTE: Assembly Notes

- Note washer installed between fastener and pivot bushing on the rear, lower control arm mount to allow sufficient clearance between nut and sway bar.
- Orientate rod ends so they are parallel with mating component.

©2010 Polaris Sales Inc.

IQ LWT Front Suspension



⚠ CAUTION

Never re-use lock nuts. Always re-assemble using new lock nuts.

= T

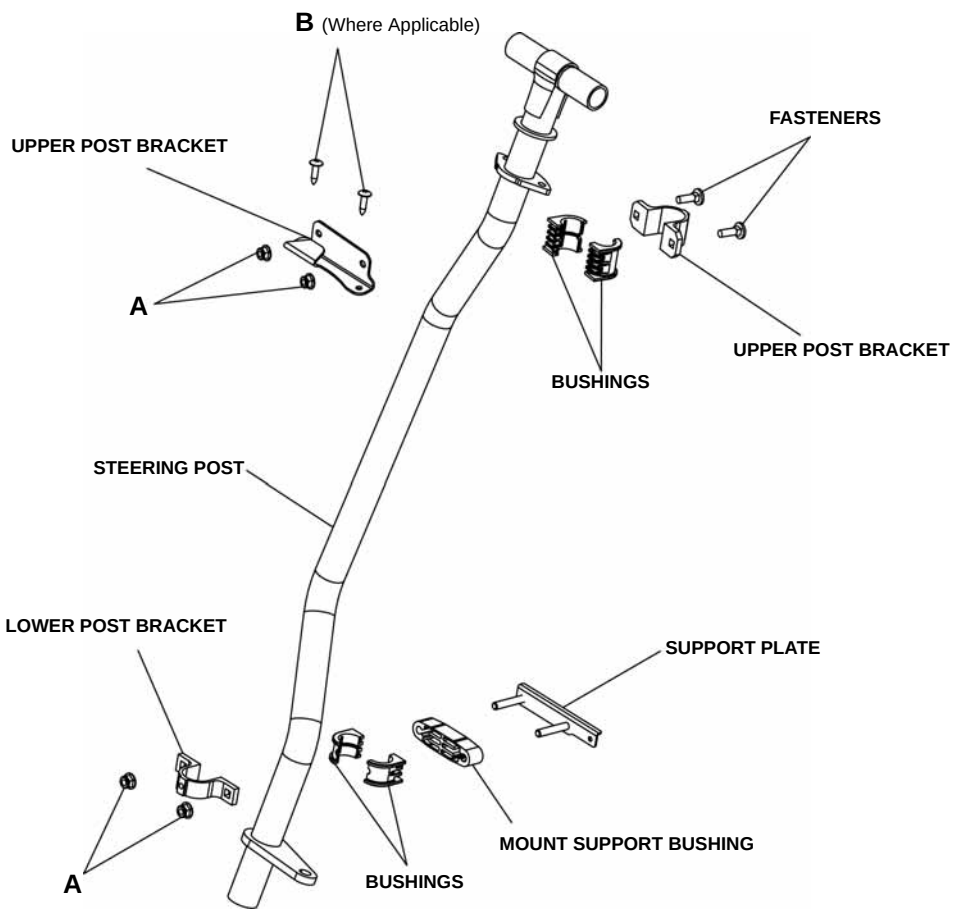
A = 29 Ft.Lb. (39 Nm) (Shock Mounting Fastener Nuts)
B = 40 Ft.Lb. (54 Nm)
C = 45 Ft.Lb. (61 Nm)

NOTE: Assembly Notes

- Note washer installed between fastener and pivot bushing on the rear, lower control arm mount to allow sufficient clearance between nut and sway bar.
- Orientate rod ends so they are parallel with mating component.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

IQ Fixed Steering Post Assembly



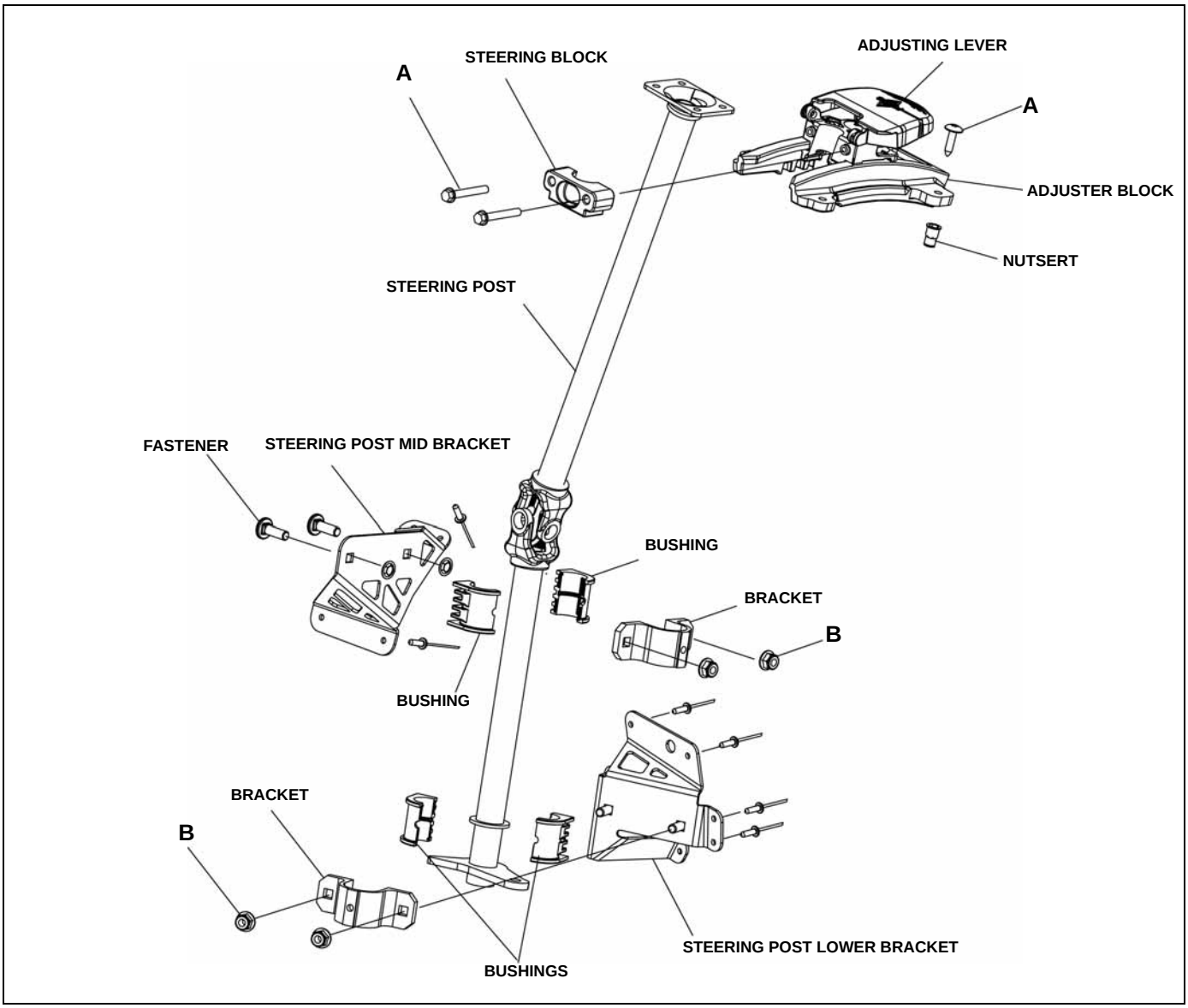
CAUTION
Never re-use lock nuts. Always re-assemble using new lock nuts.

= T
A = 16 Ft.Lbs. (22 Nm) B = 13 Ft.Lbs. (17 Nm)

8

©2010 Polaris Sales Inc.

IQ Rider Select Steering Post Assembly



CAUTION

Never re-use lock nuts. Always re-assemble using new lock nuts.

= T

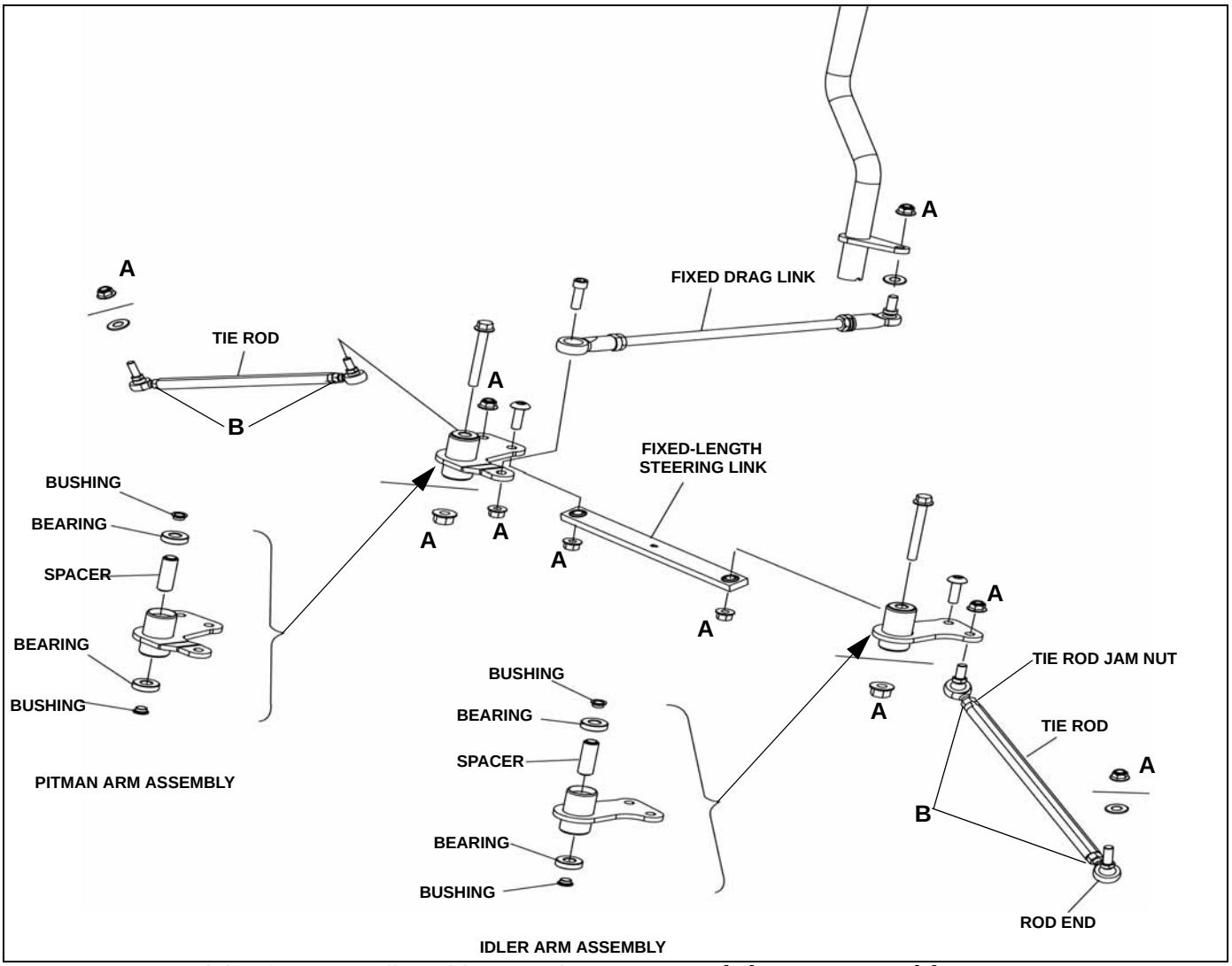
A = 7 Ft.Lbs. (10 Nm)
B = 11 Ft.Lbs. (15 Nm)

NOTE: Assembly Notes

- Torque steering post lower bracket fasteners first, then torque the steering post mid bracket fasteners.

©2010 Polaris Sales Inc.

IQ Steering Linkage



NOTE: 2007 models feature adjustable steering links.

CAUTION
Never re-use lock nuts. Always re-assemble using new lock nuts.

= T
A = 29 Ft.Lbs. (40 Nm) B = 11 Ft.Lbs. (15 Nm) (Rod end jam nuts.)

NOTE: Orientate rod ends so they are parallel with mating component.
Assault is equipped with the 42.5 IFS.

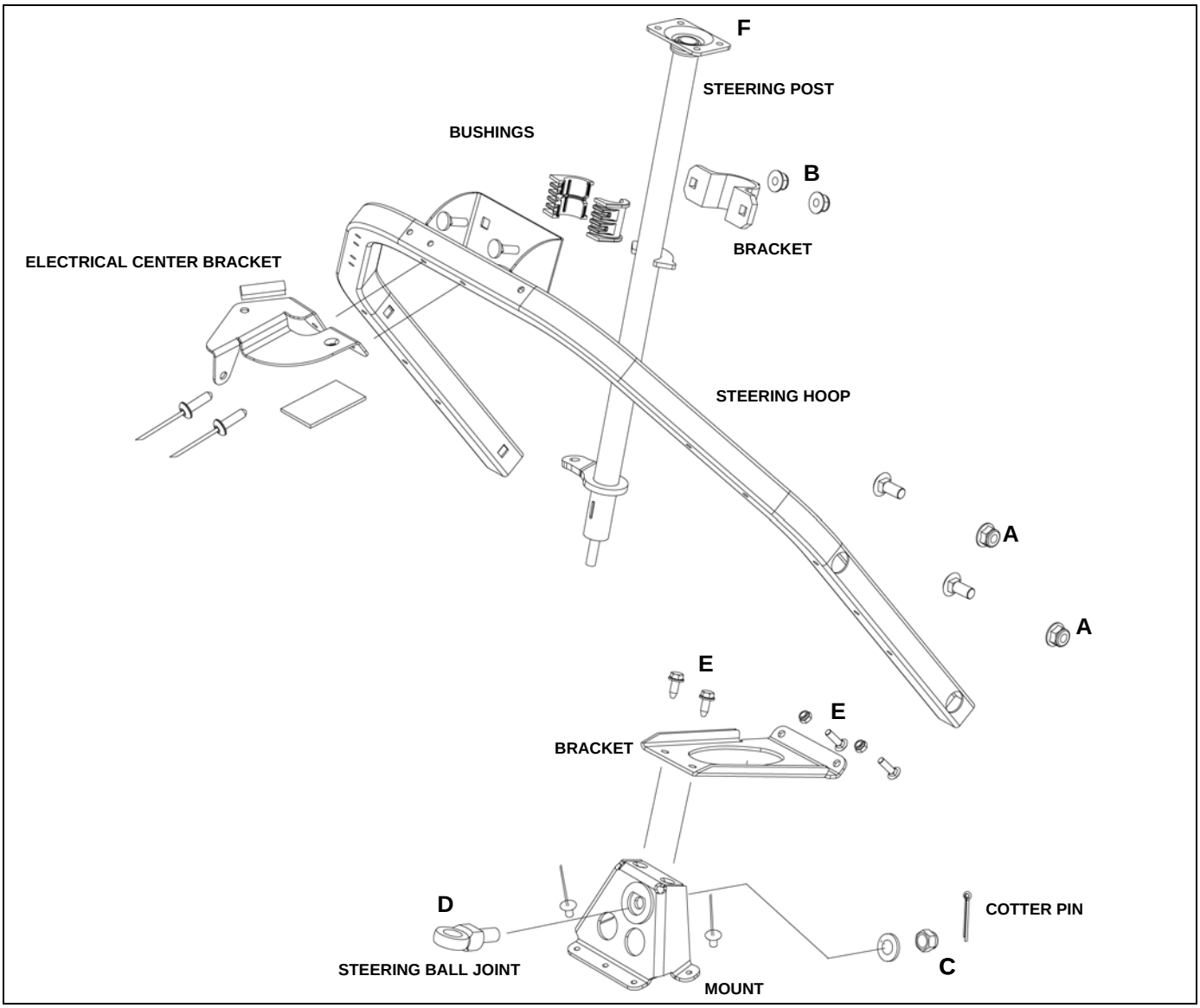
Linkage Assembly Measurements

IQ 42.5 Tie Rod Length	15.06in. (382.5mm)
IQ 42.5 Adjustable Steering Drag Link Length	14.78in. (375.4mm)
IQ 42.5 Fixed Steering Drag Link Length	15.31in. (389mm)
IQ 42.5 Steering Link Length	9.30in. (236mm)
IQ RMK Tie Rod Length	13.66in. (345mm)
IQ RMK Fixed Steering Drag Link Length	15.31in. (389mm)
IQ RMK Steering Link Length	9.30in. (236mm)

NOTE: Measurements are rod-end center-to-center with rod-ends perpendicular to tie rod.

©2010 Polaris Sales Inc.

600 Widetrak IQ Steering Assembly



CAUTION

Never re-use Nylock nuts. Always re-assemble parts using new nuts.

= T

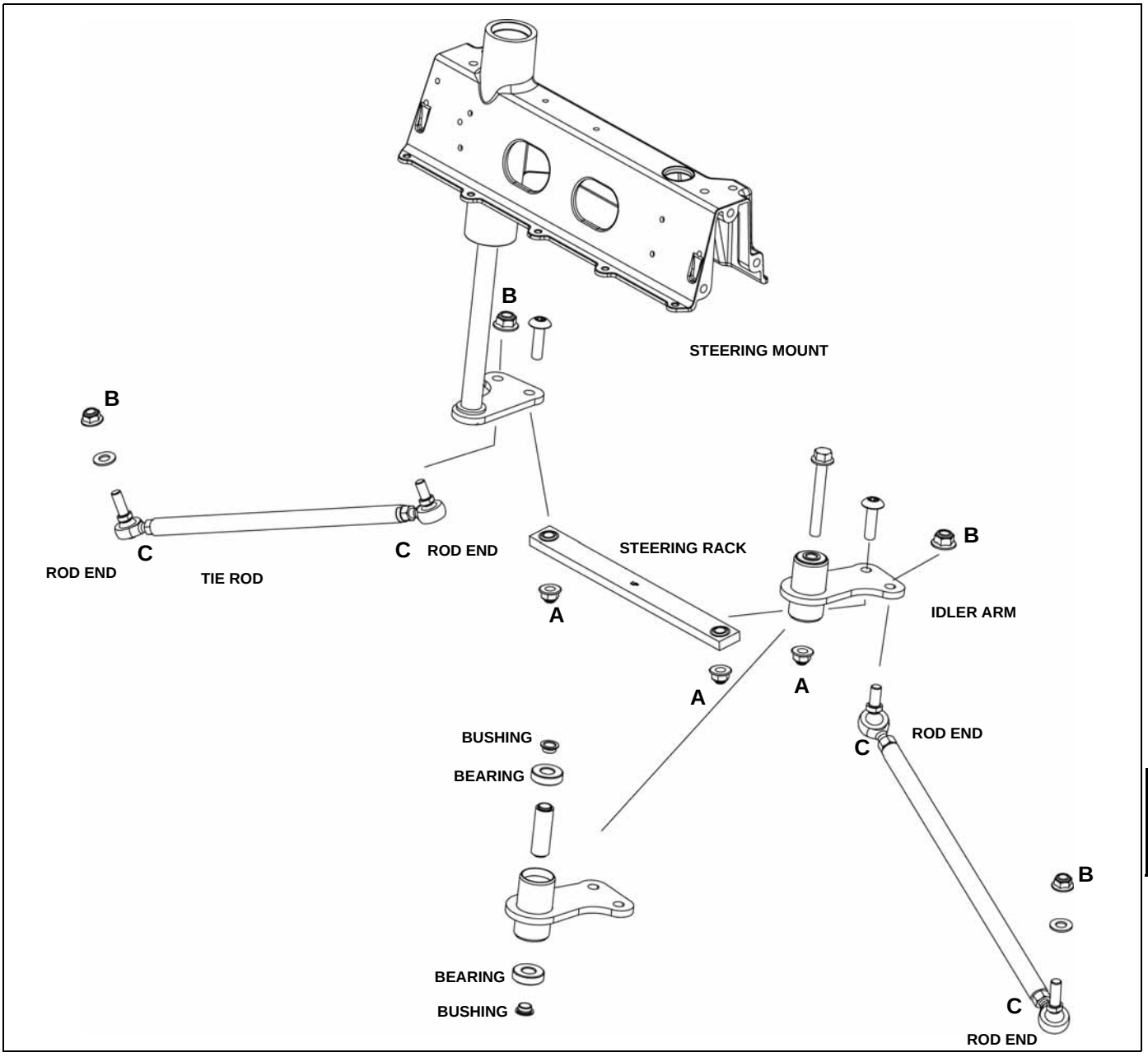
A = 18 Ft.Lbs. (24 Nm)
B = 16 Ft.Lbs. (22 Nm)
C = 35 Ft.Lbs. (47 Nm) Apply Loctite 262 to threads.
D = Post-to-Ball Joint Nut = 40 Ft.Lbs. (54 Nm)
E = 10 Ft.Lbs. (13 Nm)
F = Handlebar Clamp Fasteners (Not shown) = 16 Ft.Lbs. (22 Nm)

Assembly Notes:

- Always use a new cotter pin.
- Apply Polaris All Season Grease to the inner surface of the post block and where the steering post rests in the adjuster block.
- Do not over-torque steering hoop fasteners.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

600 Widetrak IQ Steering Linkage



CAUTION

Never re-use Nylock nuts. Always re-assemble parts using new nuts.

= T

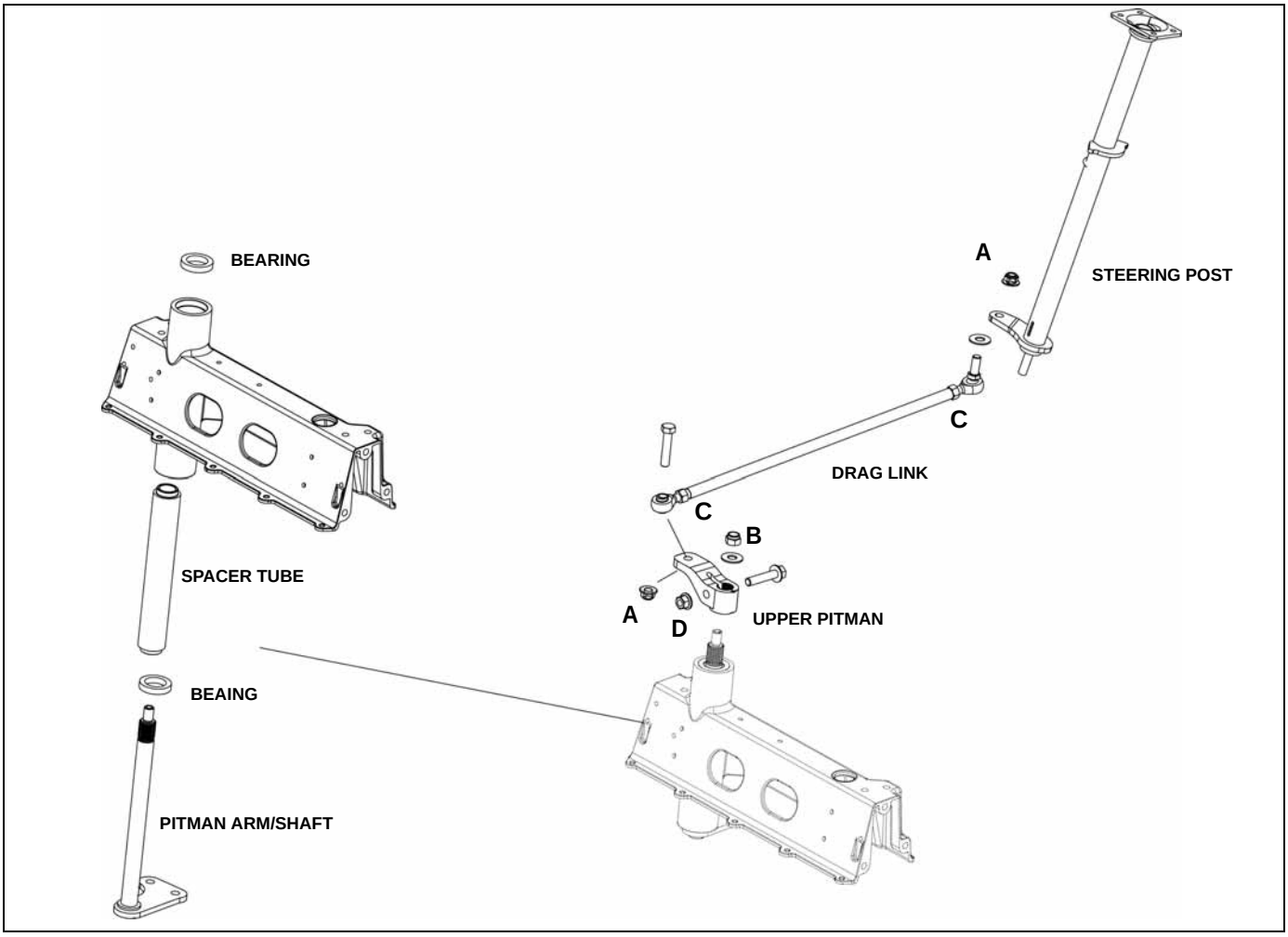
A = 29 Ft.Lbs. (39 Nm)
B = 40 Ft.Lbs. (54 Nm)
C = Jam Nuts = 11 Ft.Lbs. (15 Nm)

Assembly Notes

- Tie Rod Length = 15.06" (38.25cm)
- Measure tie rod length between center of one rod end to center of other rod end.

©2010 Polaris Sales Inc.

600 Widetrak IQ Steering Mount



CAUTION
Never re-use Nylock nuts. Always re-assemble parts using new nuts.

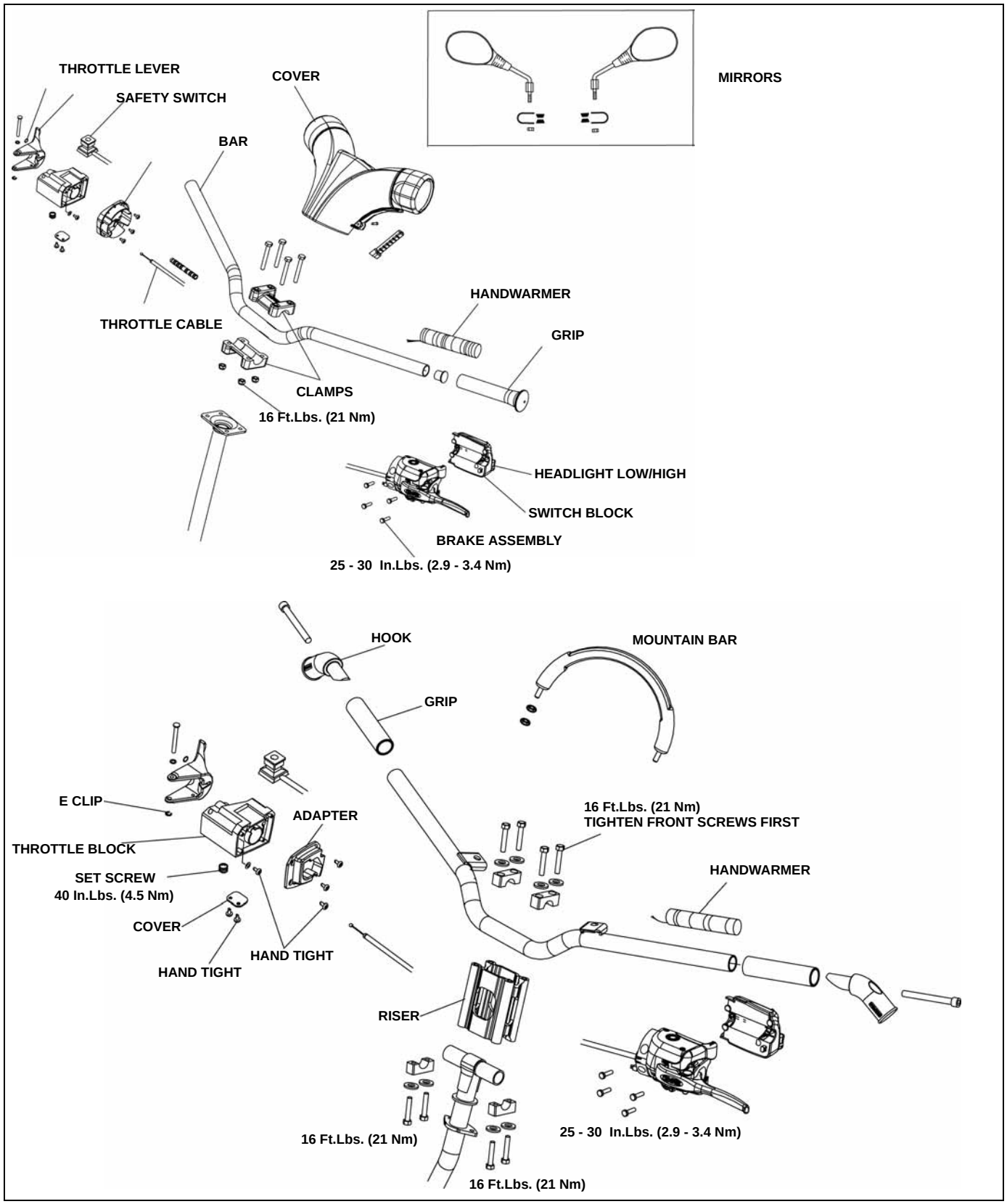
= T
A = 29 Ft.Lbs. (39 Nm) B = 40 Ft.Lbs. (54 Nm) C = 11 Ft.lbs. (15 Nm) D = 28 Ft.Lbs. (38 Nm)

Assembly Notes

- Drag Link Length = 20" (51cm)
- Measure drag link length between center of one rod end to center of other rod end.
- Align upper pitman mark with pitman arm/shaft mark during assembly.

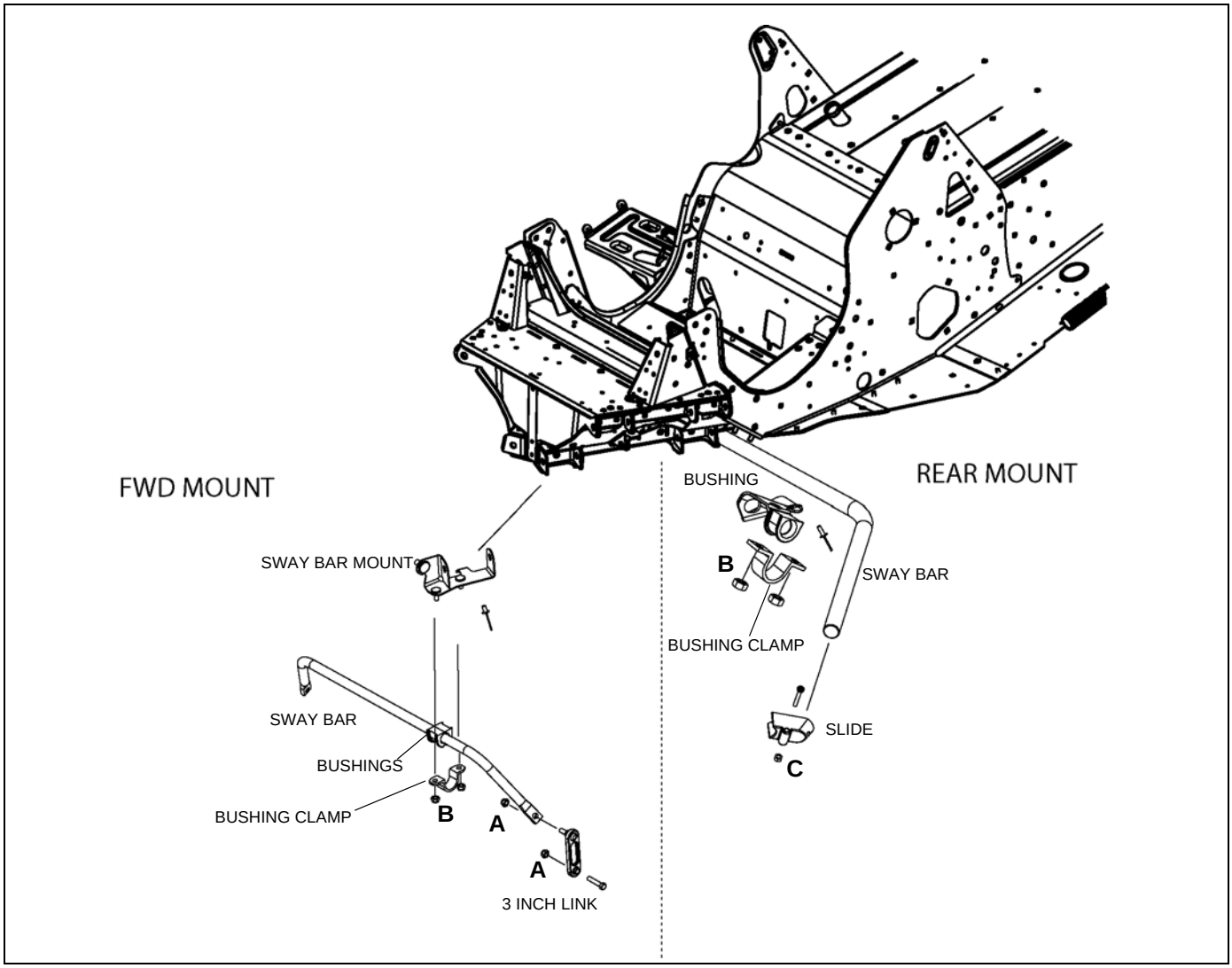
©2010 Polaris Sales Inc.

Handlebar Assemblies



©2010 Polaris Sales Inc.

Front Sway Bar Assemblies



CAUTION
Never re-use lock nuts. Always re-assemble using new lock nuts.

= T
A = 15 Ft.Lbs. (Nm) B = 5 Ft.Lbs. (Nm) C = Hand Tight

NOTE: One lower control arm and IFS shock will have to be removed from one side of the vehicle to remove a rear mount sway bar.
RMK (non-Assault) vehicles utilize narrower diameter sway bars.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

FRONT SUSPENSION SETTINGS

Overview

The following topics are outlined involving the front suspension:

- Maximum Width
- Handlebar Centering
- Setting Camber
- Ski Toe Adjustment

Before making any adjustments to the front suspension, inspect all components for damage. Replace any broken, bent or worn components before making any adjustments.

On models featuring a sway bar, verify the sway bar and related hardware are not bent, loose, or broken. Inspect the shocks.

The shocks on IQ front suspensions are the only components that limit maximum control arm extension. Bent shock rod(s) adversely affect front suspension settings and handling.

Never install longer (when fully extended) shocks. Installing longer shocks will stress the upper control arm rod ends and lower control arm spherical bearings.

Always verify track alignment. Proper track alignment is critical when aligning the skis with the chassis.

Rod ends must be parallel with mating components. Rod ends that are not parallel will increase the “bump steer” effect.

An alignment bar is an essential tool required to center the handlebars, and set camber.

Alignment Bar Specifications

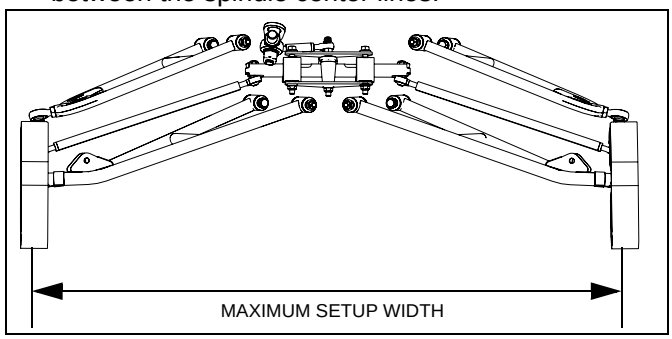
- DIAMETER: .623”-.625” (15.824-15.875mm)
- LENGTH: 45” (114.3cm)
- MATERIAL: C-1018
- Polaris PN: 5333508 (Order from tool vendor.)

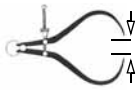
Maximum Width

The maximum width setting is the distance between the front center lines of both spindles with the skis off the ground and the shocks installed on any IQ front suspension.

Because of the design of the IQ front suspension, maximum width can only be changed by adjusting camber. This is due to the fact that only the upper control arms feature rod ends and thus camber can only be adjusted by turning the upper control rod ends in or out.

1. To measure the maximum setup width, raise the front of the snowmobile off the ground with the shocks and skis installed.
2. Center the skis/spindles. Measure the distance between the spindle center lines.




= In. / mm.

IQ 42.5 Maximum Width 42.5in. (108cm) IQ RMK Maximum Width 38.67 (98.2cm)

3. If the measurement is out of specification, inspect the front suspension for damage. Replace damaged components.
4. If no damage is found, reset the camber.

Handlebar Centering

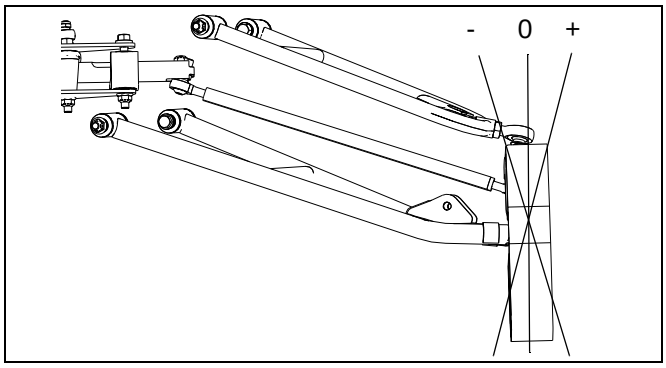
1. Raise the vehicle to remove the skis.
2. Verify the handlebars are straight. Measure from each bar end to a common center point at the rear of the vehicle.
3. Verify the steering drag link is not damaged, bent, or loose. If it is, the drag link must be either adjusted or replaced. If the drag link is correct, adjust the steering linkage tie rod ends until handlebar is centered. Note that the toe setting will require adjustment.
4. Reinstall the spindle rod ends, bushings, and skis. Torque bolts to specifications.

©2010 Polaris Sales Inc.

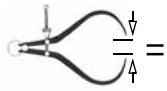
Camber

On a snowmobile, camber is the angle of the spindle relative to vertical as viewed from the front. The camber angle becomes increasingly more negative as the control arms deflect upward.

- 0 = Neutral Camber. The spindle is perpendicular to the ground.
- + = Positive Camber. The top of the spindle is canted outward from the chassis.
- - = Negative Camber. The top of the spindle is canted inward towards the chassis.

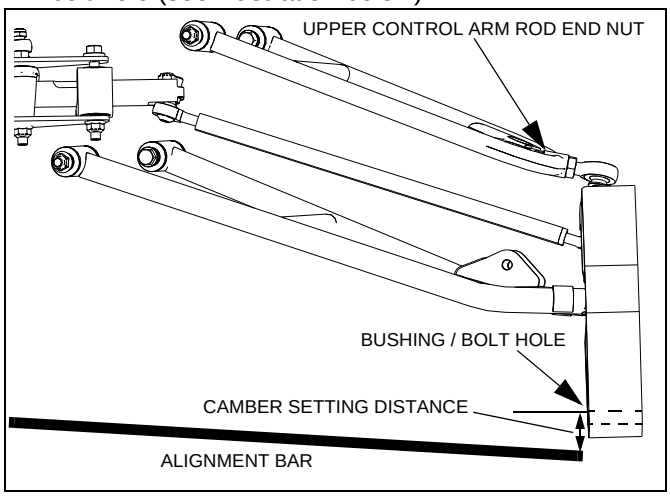


Camber Adjustment


= In. / mm.

Camber Setting
Top of alignment bar to top of ski bushing / bolt spindle hole.
IQ 42.5 = 2.25±.31/57.2±7.9
IQ RMK = 2.17±.31/55±7.9

1. Verify the handlebars are centered. Measure from each end to a common center point at the rear of the snowmobile in necessary.
2. Raise the front of the snowmobile off the ground. Remove the skis and ski bushings.
3. Verify the shocks are at full extension and that no IFS components are bent or damaged. Replace any component that is damaged before making any adjustments.
4. Insert the alignment bar, PN 5333508 or equivalent, through one spindle. Adjust the opposing spindle's upper control arm rod end to adjust the angle of the spindle.
5. Check the measurement between the top-end of the alignment bar and the top of the spindle's bushing/ski bolt hole (see illustration below).



6. Insert the alignment bar into the opposite spindle and perform the same steps. Monitor the specified camber measurement as the control arm rod end nuts are adjusted.
7. Continue making small rod end changes to both control arm rod end nuts until the camber setting specification is achieved at both spindles.

⚠ CAUTION

DO NOT EXCEED THE MAXIMUM SETUP WIDTH SETTING WHEN ADJUSTING CAMBER.

8. Verify the upper rod ends are torqued to specification. Ensure the rod ends remains parallel to the spindles when torquing nuts.
9. Apply a liberal amount of Premium Grease to the ski bushings, and then reinstall the bushings and skis. Torque fasteners to specification.

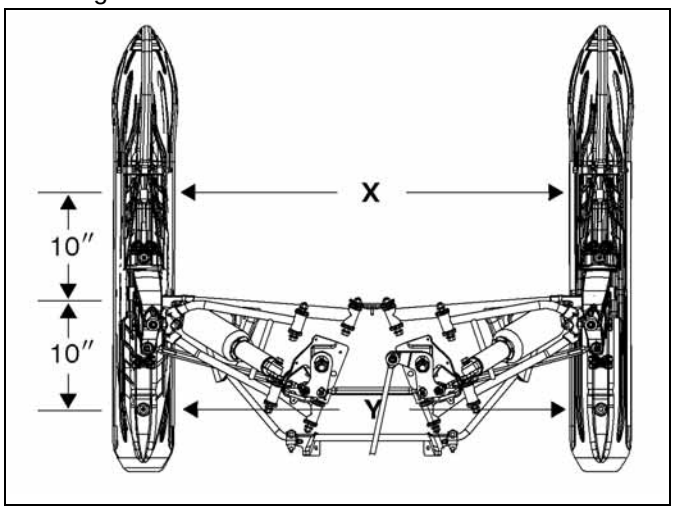
9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

Toe Adjustment

Toe is adjusted with the shocks and skis installed. Track alignment must be correct before starting this process.

Toe alignment is measured at ride height.

1. Rock the front end of the vehicle up and down and then set it down gently. This will set the front suspension at ride height.
2. Verify the handlebars are centered. Measure from each end to a common center point at the rear of the snowmobile to verify.
3. Measure and make a mark 10” (2.54cm) forward of the ski mount bolt and 10” (2.54cm) behind the ski mount bolt, preferably on the center line of the carbide skags.



4. Place a straight edge along the one side of the track. Make sure that the straight edge is touching along the length of the track.
5. Record the measurements from the edge of the straight edge to the forward ski mark (X) and the rearward ski mark (Y).
6. Adjust the tie rod so that both measurements are the same.
7. Place the straight edge on the opposite side of the track and measure the opposite ski marks.
8. Adjust the tie rod so that both measurements are the same.
9. Steps 3 to 8 will align the skis with the track. At this point, verify the handlebar is centered with the skis.

NOTE: The handlebar can be aligned with the skis on models featuring an adjustable drag link by adjusting the length of the drag link. If the snowmobile does not feature an adjustable drag link, handlebar-ski alignment can only be performed by adjusting the steering tie rod lengths.

10. Turn both tie rods equally to set ski toe. When finished, measurement (X) should be 0" - 1/8" wider than measurement (Y).
11. Torque steering tie rod jam nuts to specification and lower the vehicle.

©2010 Polaris Sales Inc.

DISASSEMBLY AND ASSEMBLY

Spindle Removal

1. Securely support the front of the machine up off the floor.
2. Remove the ski(s).
3. Remove the upper control arm (UCA)-to-spindle fastener.
4. Remove the fastener securing the lower control arm (LCA) to the spindle. Note the orientation of the fastener and nut.
5. Remove the tie rod from the spindle, by removing the nut and bolt.

Spindle Assembly

1. Assembly is the reverse order of disassembly. Reference the front suspension assembly illustration for fastener torque values.

Spherical Bearing Replacement

1. Remove the fastener securing the lower control arm (LCA) to the spindle.
2. Remove the lower shock fastener.
3. Remove the fasteners securing the LCA to the bulkhead.
4. Remove the snap ring, then, using a press, press the spherical bearing out of the LCA.
5. Press in a new bearing, then install the snap ring.
6. Assemble the LCA into the spindle, and shock into LCA. Reference front suspension assembly illustration for fastener torque values.

Upper / Lower Control Arm Removal

1. Remove the fastener securing the control arm being removed from the spindle. Remove the lower shock fastener.
2. Remove the fasteners securing the control arm to the bulkhead.
3. Remove the control arm, pivot bushings, and pivot shafts.

Upper / Lower Control Arm Installation

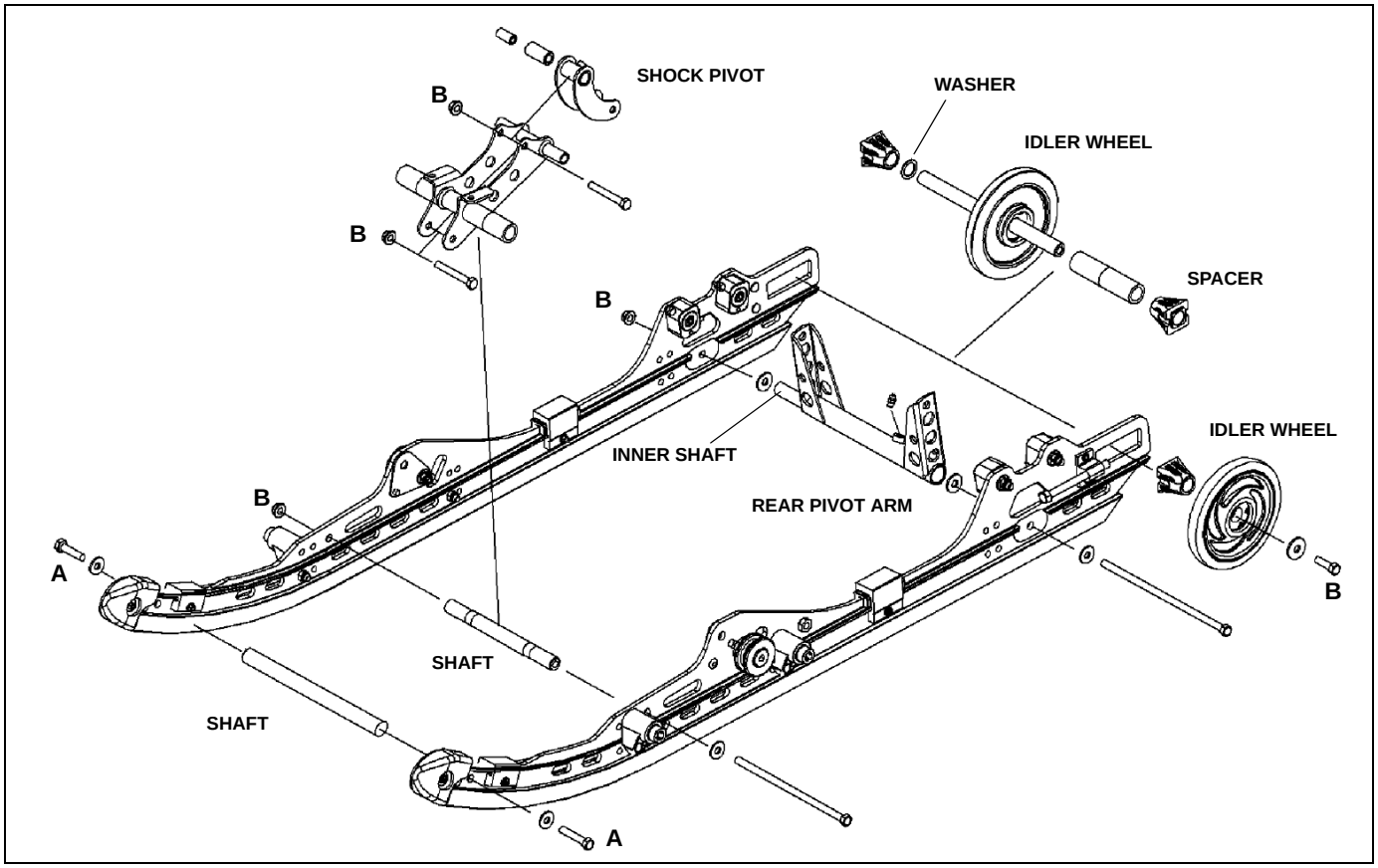
1. Replace the upper or lower control arm bushings in the control arm(s).
2. Replace the upper or lower control arm(s) into the bulkhead.
3. Reference the front suspension illustration for the appropriate fastener torque.

NOTE: There is a washer located on the rearward lower control arm mounting at the bolt head.

©2010 Polaris Sales Inc.

REAR SUSPENSION ASSEMBLY ILLUSTRATIONS

IQ 121 Pivots/Rear Idler



= T
A = 45 Ft.Lb. (61 Nm) B = 35 Ft.Lb. (47 Nm)

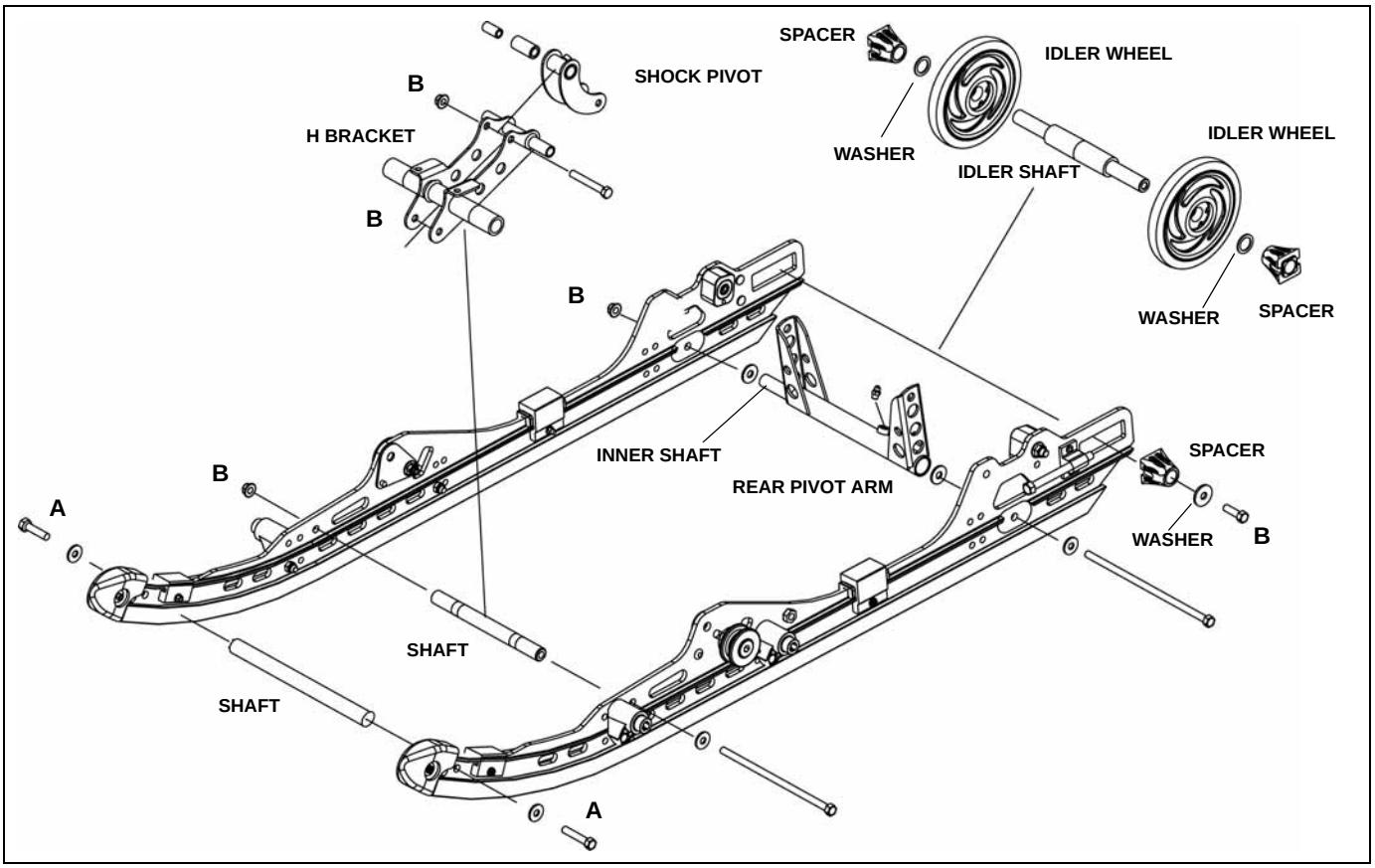
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ 121 Shift Pivots/Rear Idler



= T
A = 45 Ft.Lb. (61 Nm) B = 35 Ft.Lb. (47 Nm)

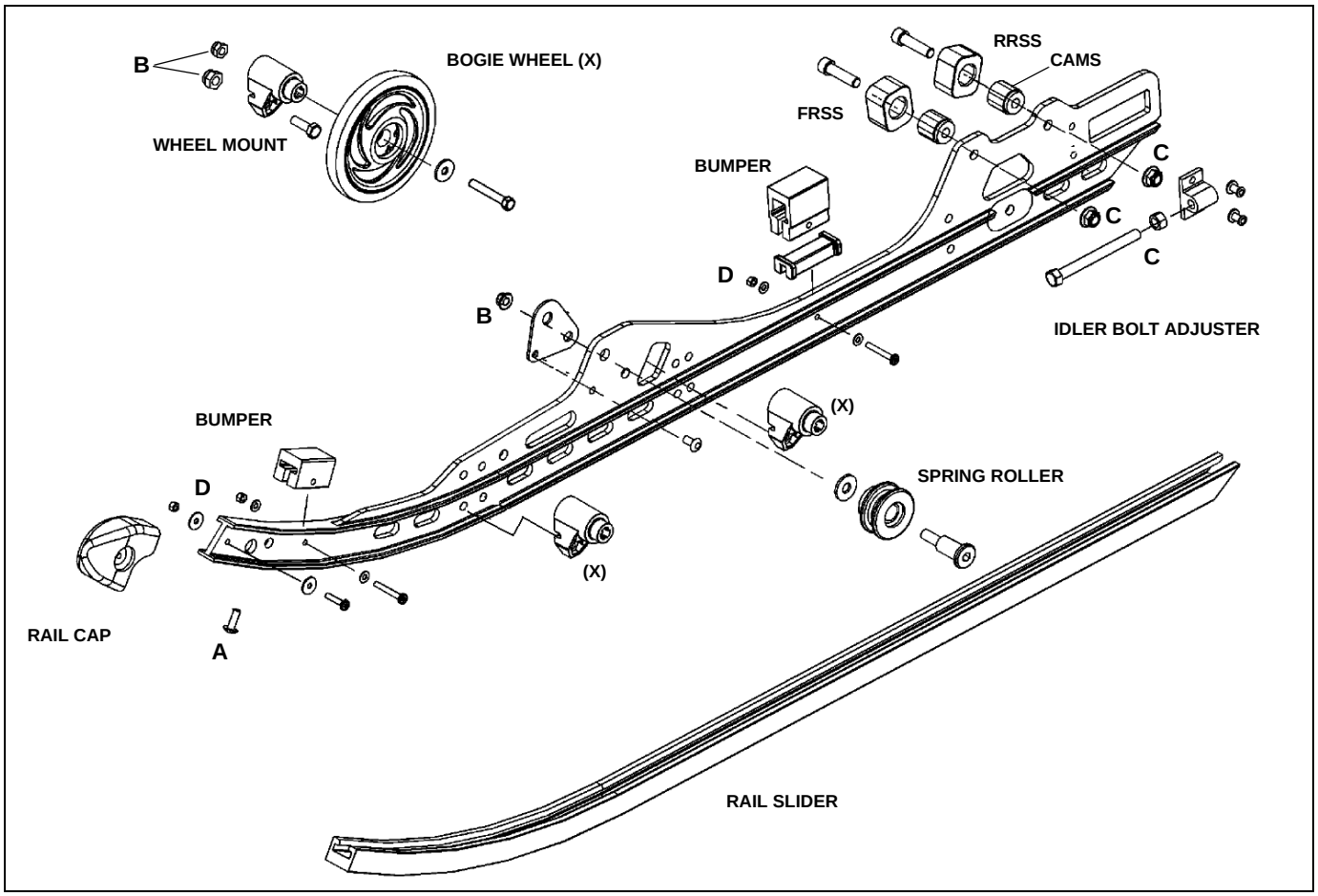
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ 121 Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 Ft.Lb. (47 Nm) D = 35 In.Lb. (2 Nm) Rail Tips w/6mm Shank Screw = 4 Ft.Lbs. (5.4 Nm)

Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

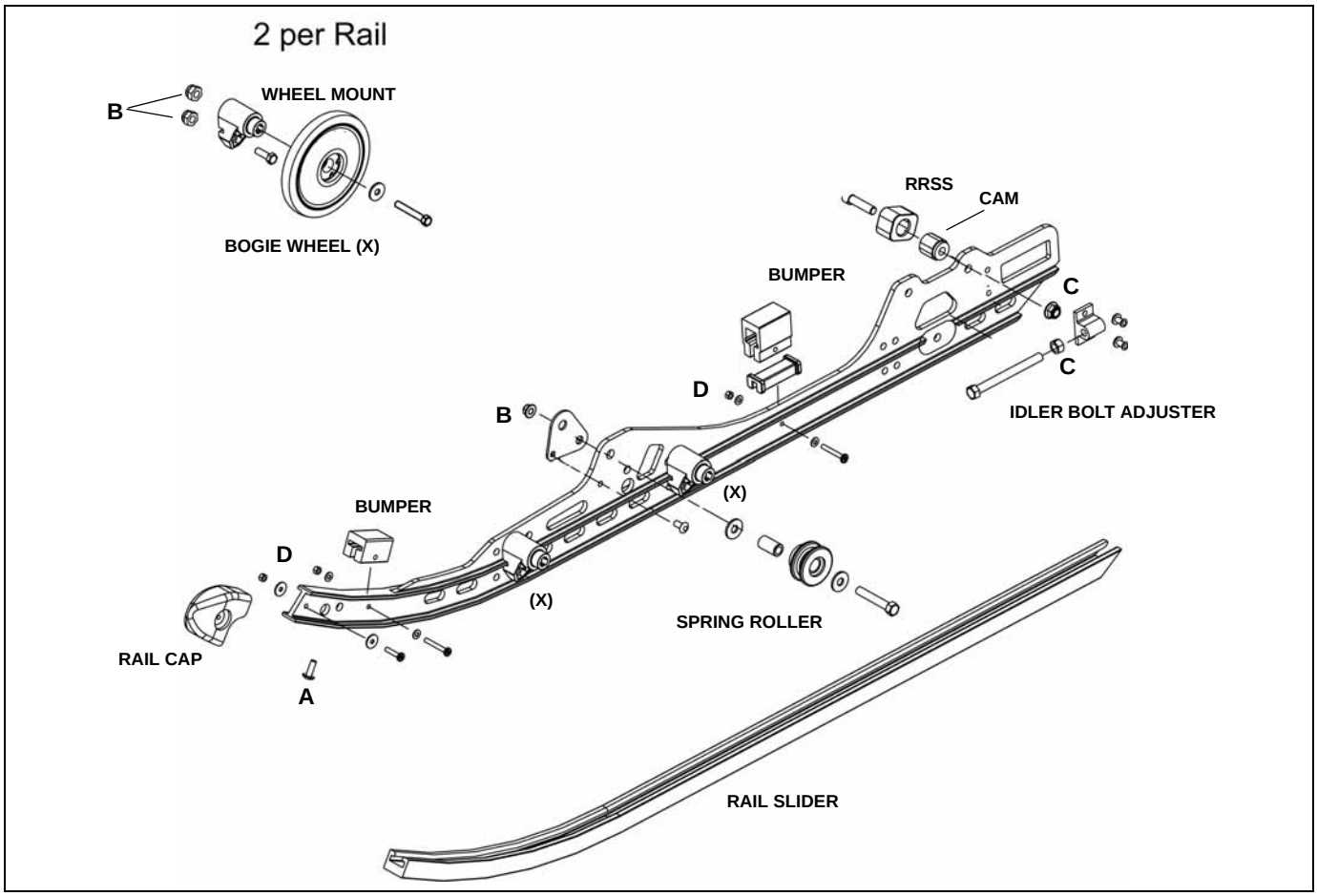
⚠ CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

8

©2010 Polaris Sales Inc.

IQ 121 Shift Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 Ft.Lb. (47 Nm) D = 35 In.Lb. (4 Nm) Rail Tips w/6mm Shank Screw = 4 Ft.Lbs. (5.4 Nm)

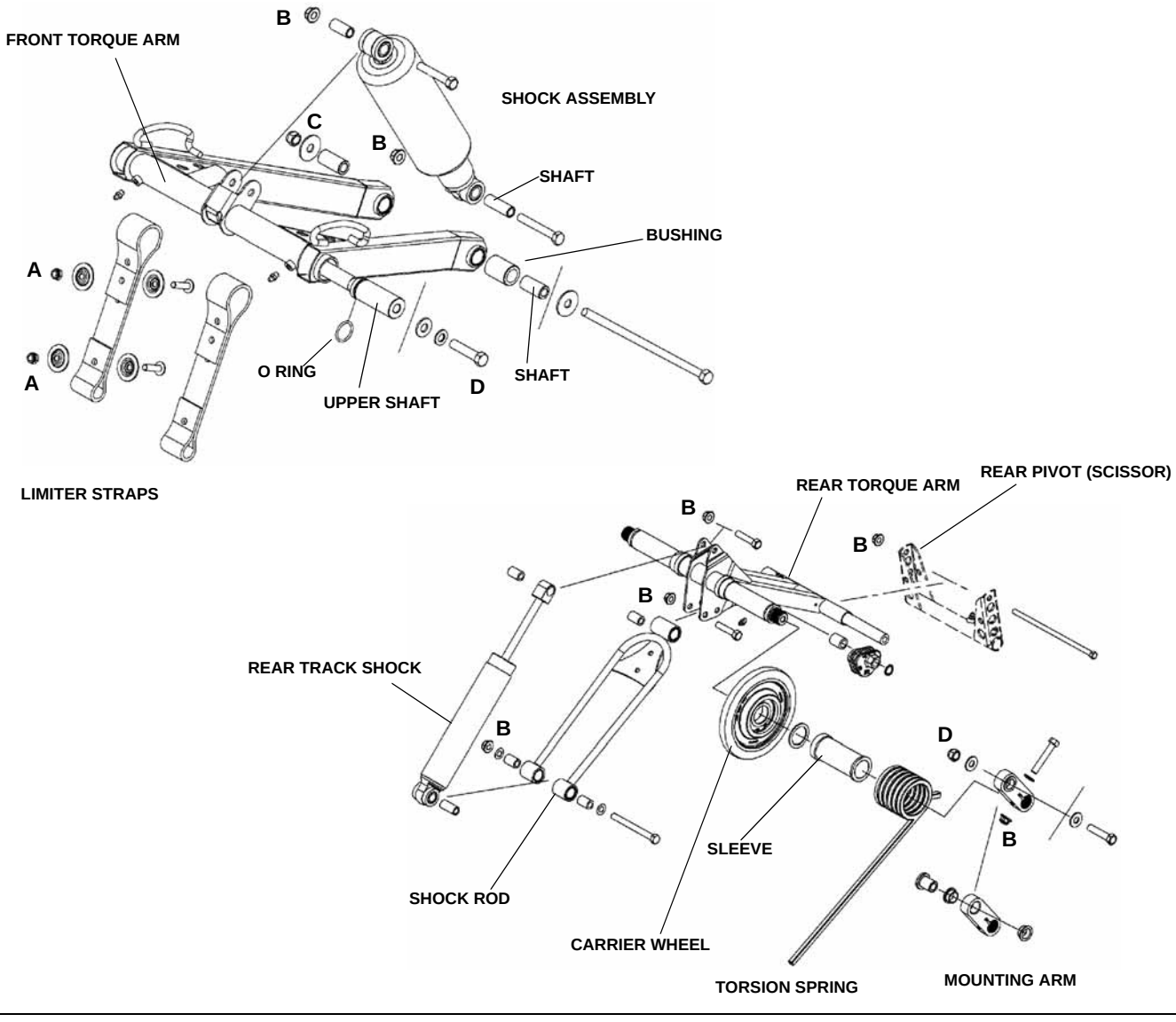
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ 121/Shift Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 35 Ft.Lb. (47 Nm) C = 45 Ft.Lb. (61 Nm) D = 60 Ft.Lb. (81 Nm)

Assembly Notes

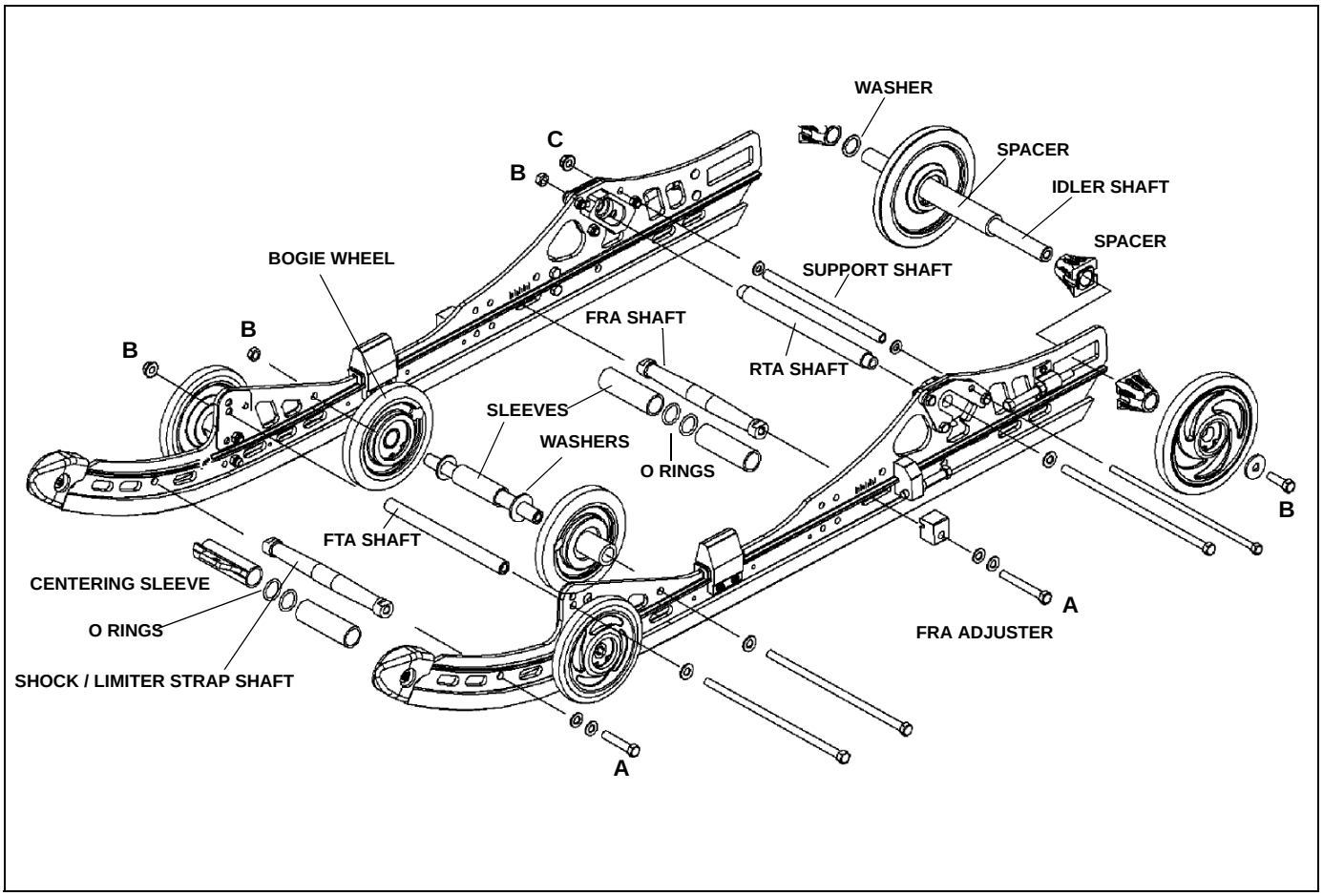
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

©2010 Polaris Sales Inc.

M-10 128 Pivots/Rear Idler



= T
A = 45 Ft.Lb. (61 Nm) B = 35 Ft.Lb. (47 Nm) C = 19 Ft.Lb. (26 Nm)

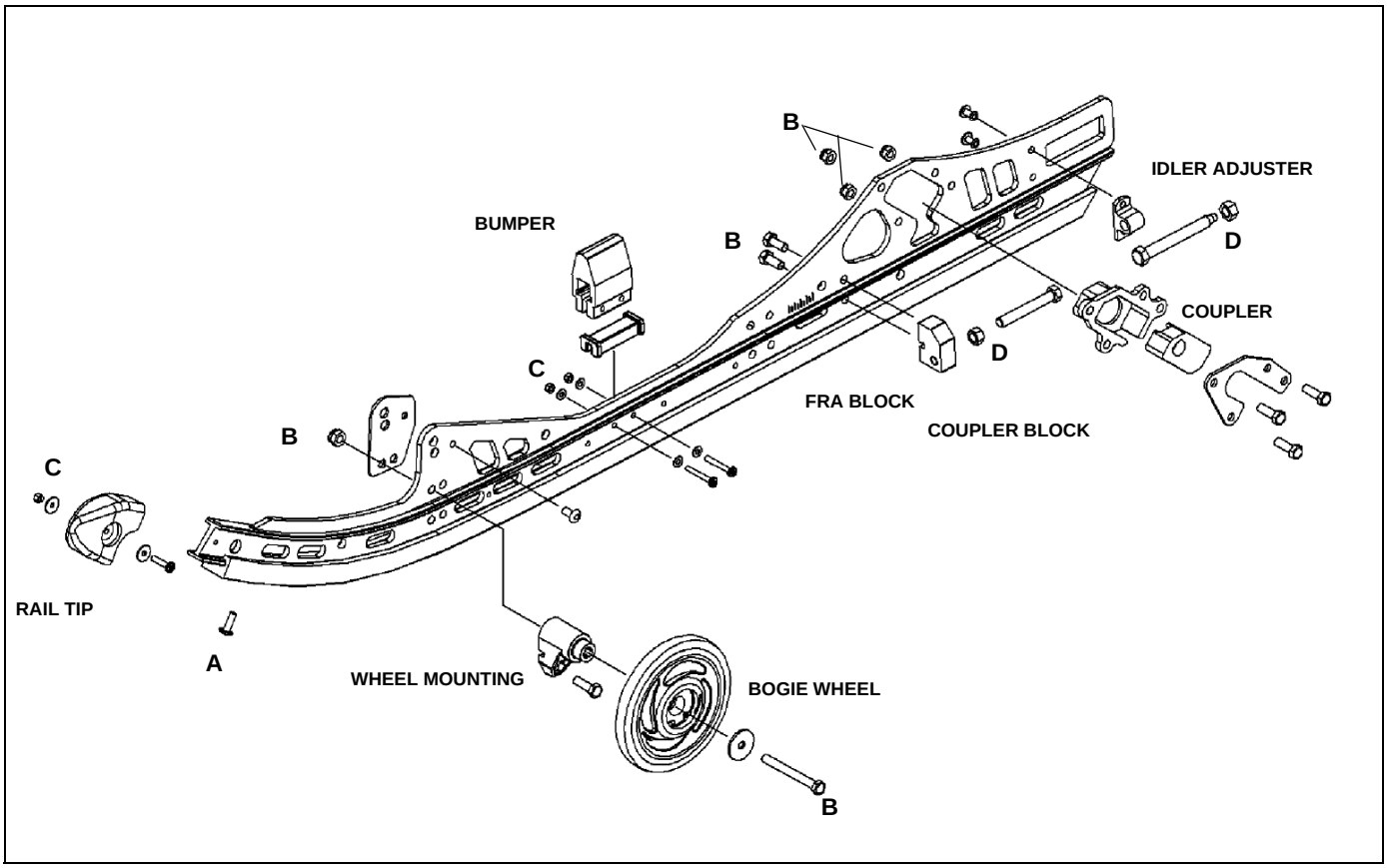
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

M-10 128 Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 In.Lb. (4 Nm) D = 35 Ft.Lb. (47 Nm)

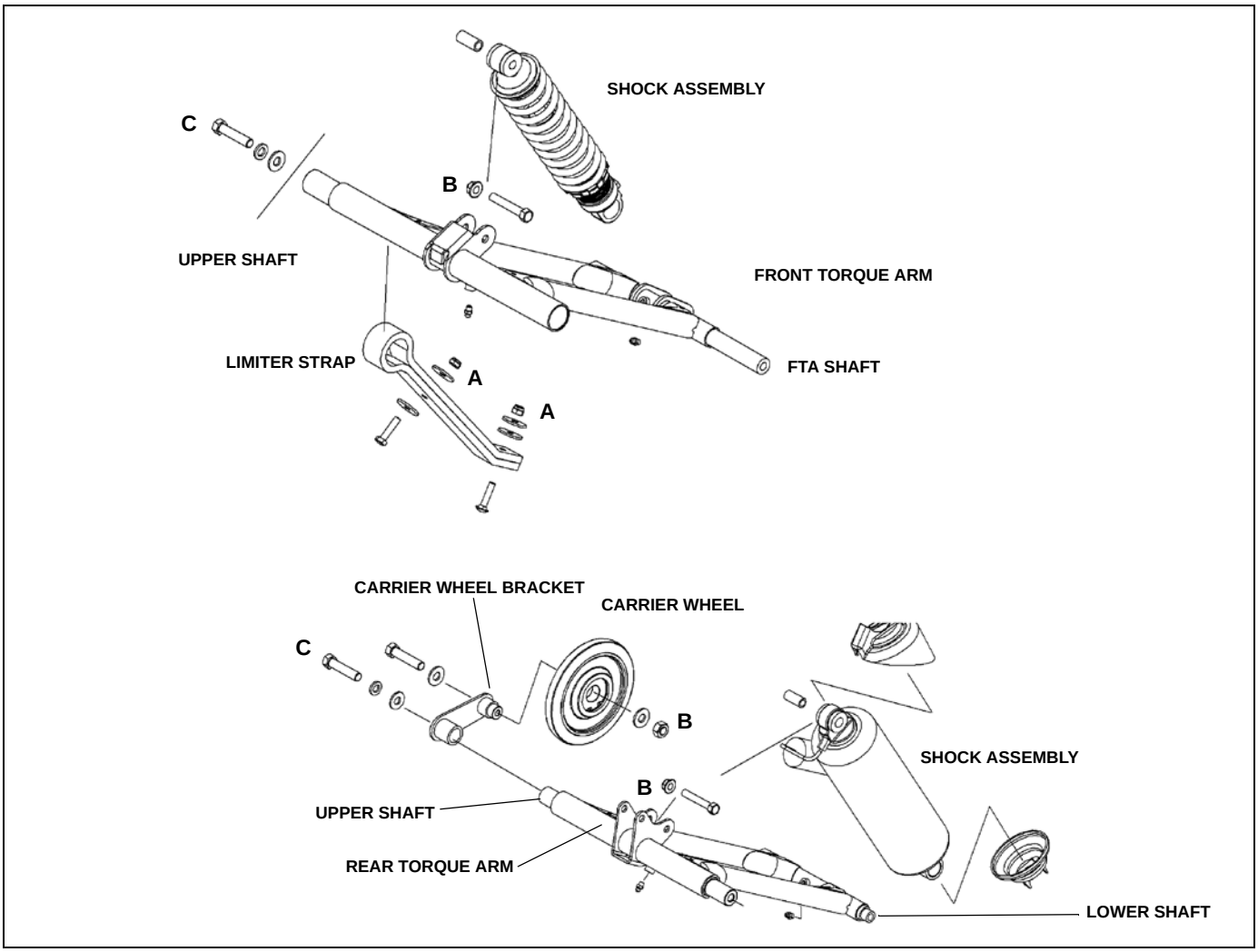
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

M-10 128 Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 35 Ft.Lb. (47 Nm) C = 70 Ft.Lb. (94 Nm)

Assembly Notes

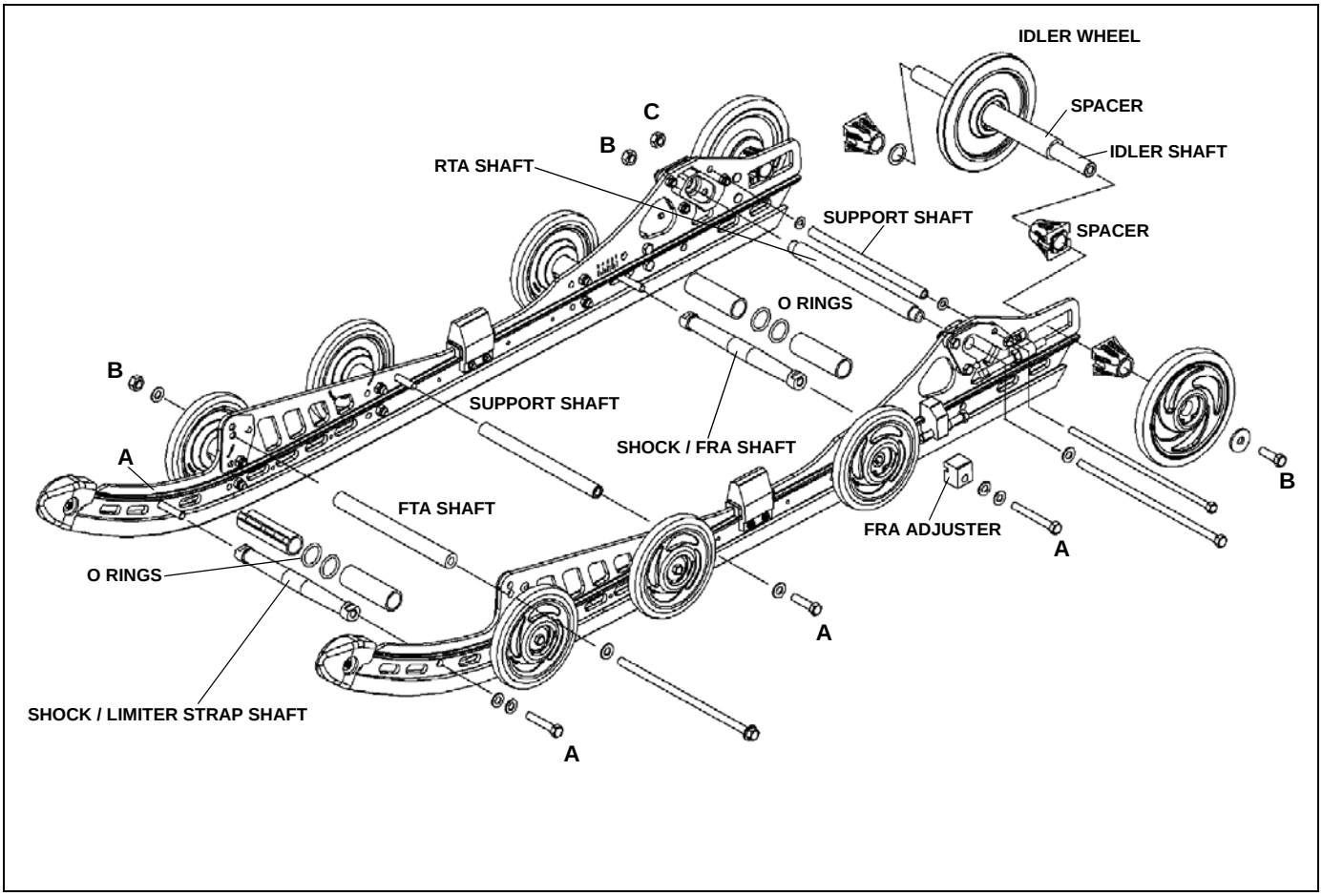
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

©2010 Polaris Sales Inc.

M-10 136 Pivots/Rear Idler



= T
A = 45 Ft.Lb. (61 Nm). B = 35 Ft.Lb. (47 Nm) C = 19 Ft.Lb. (26 Nm)

Assembly Notes

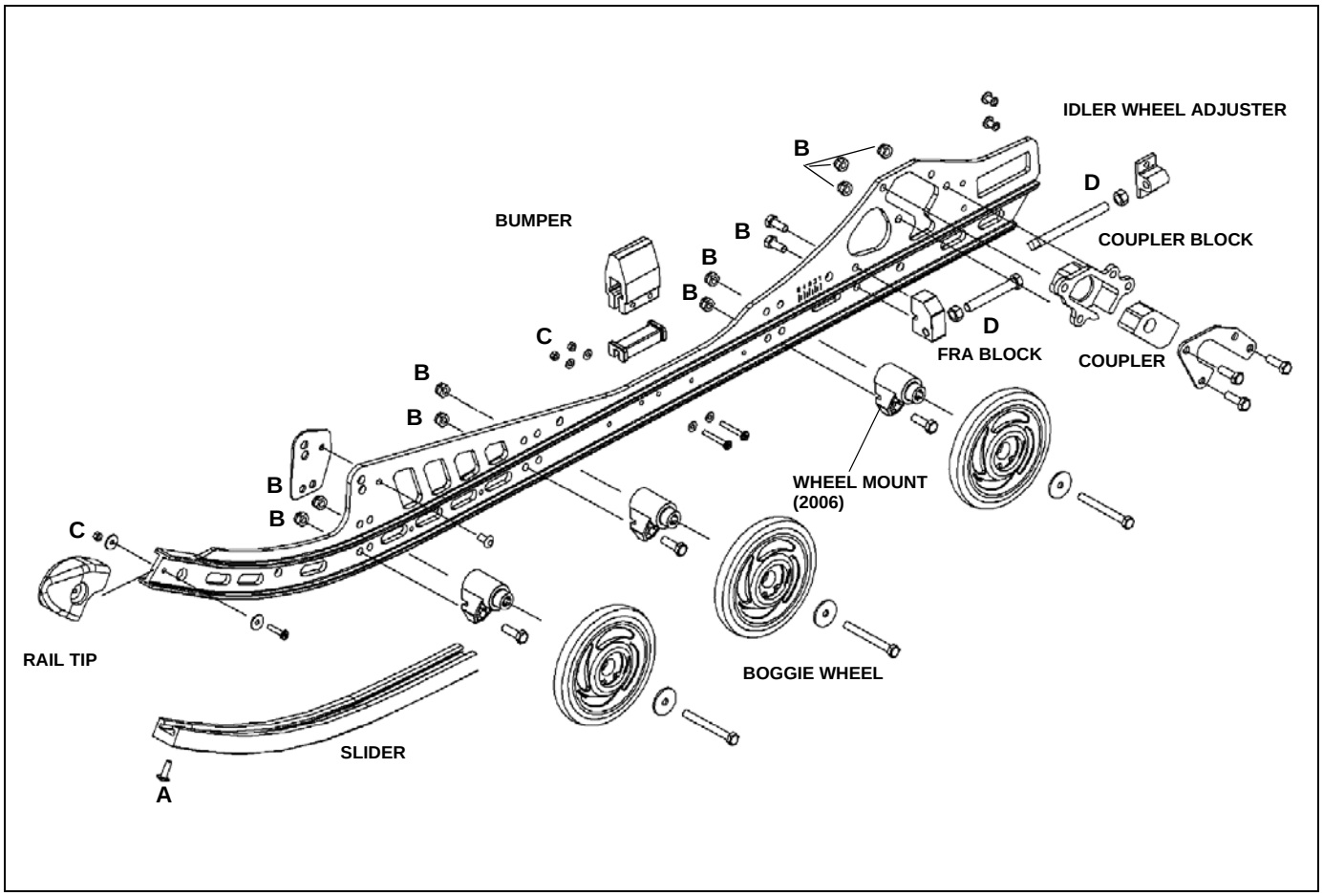
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

M-10 136 Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 In.Lb. (4 Nm) D = 35 Ft.Lb. (47 Nm)

Assembly Notes

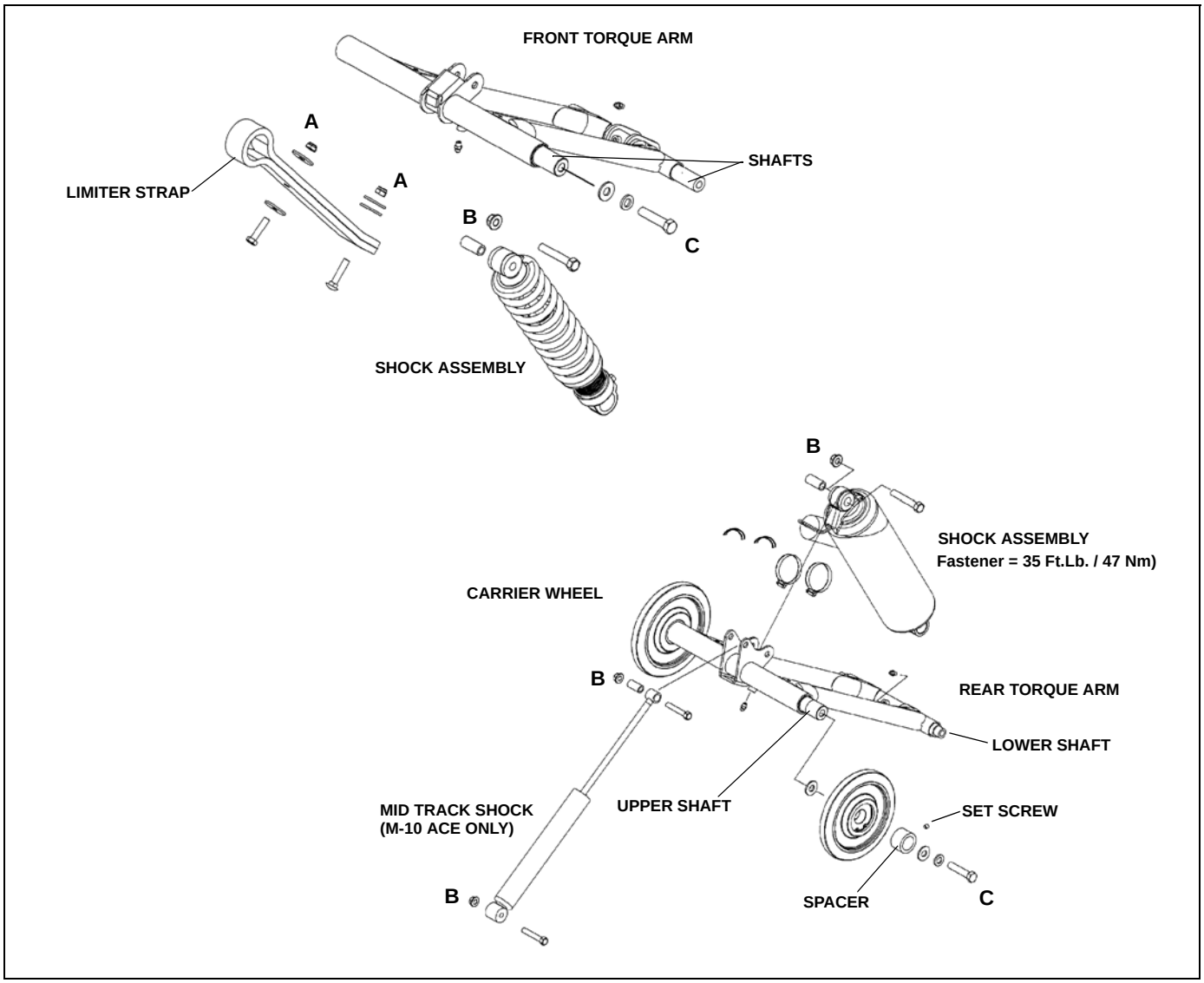
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

M-10 136 Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 35 Ft.Lb. (47 Nm) C = 70 Ft.Lb. (94 Nm)

Assembly Notes

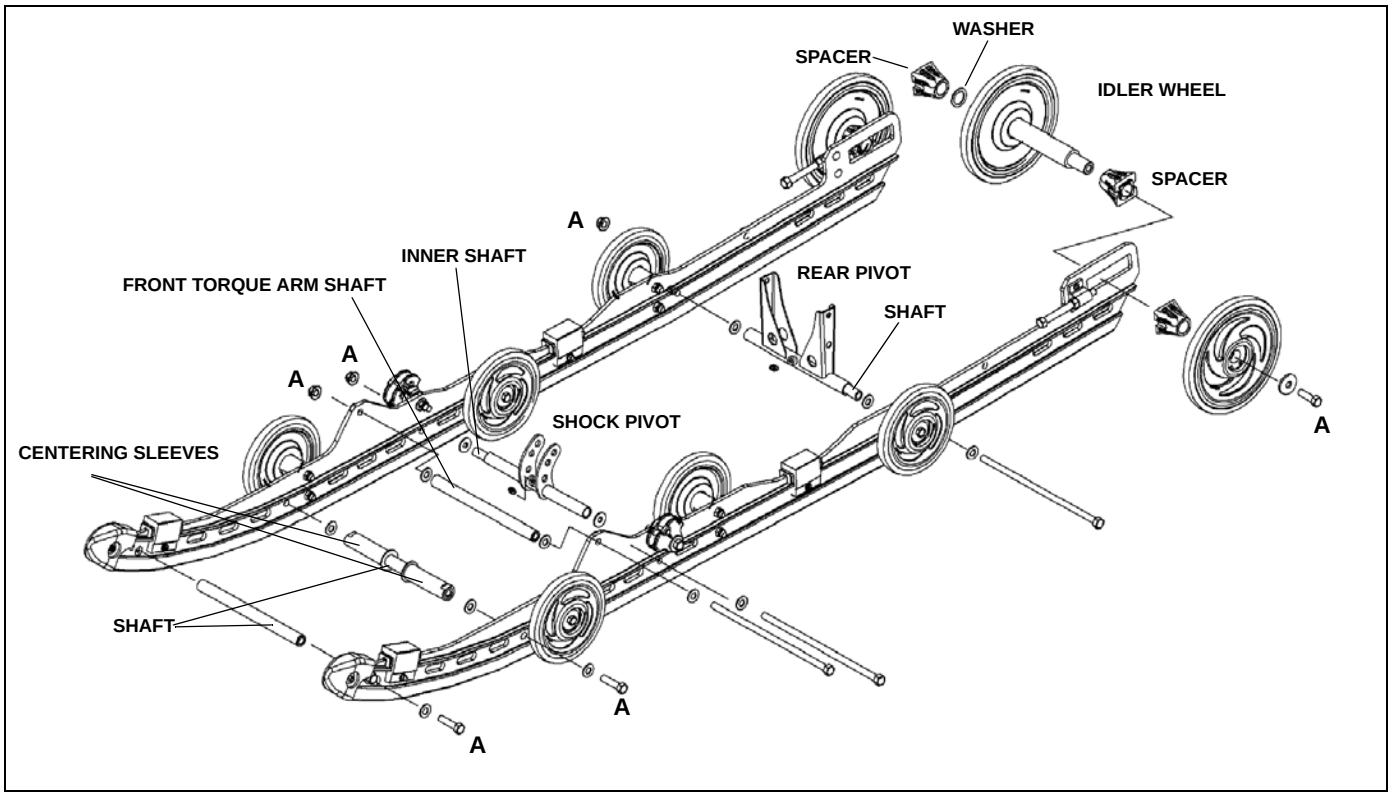
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

©2010 Polaris Sales Inc.

IQ Switchback 144 Pivots/Rear Idler



= T
A = 35 Ft.Lb. (47 Nm)

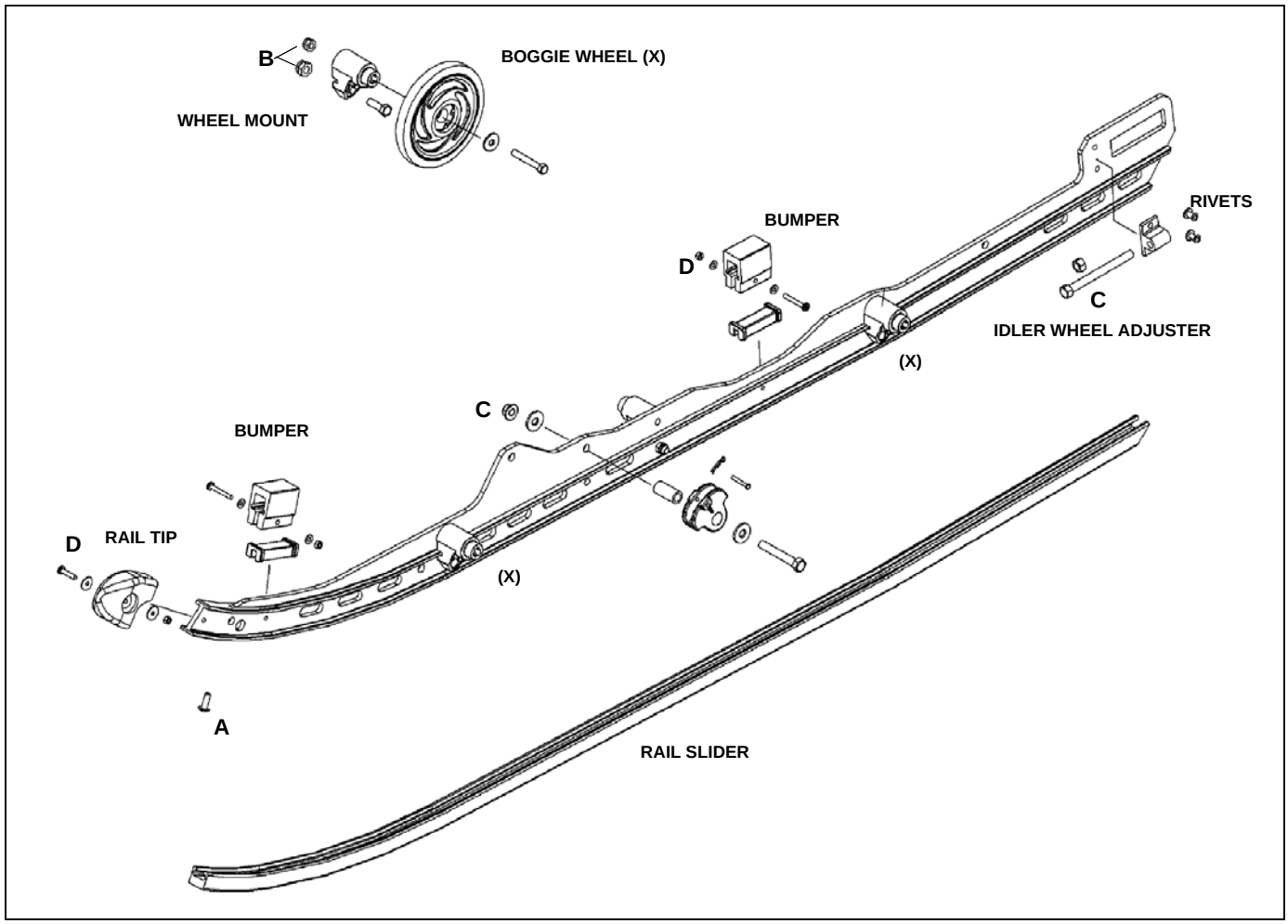
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

IQ Switchback 144 Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 Ft.Lb. (47 Nm) D = 35 In.Lb. (4 Nm) Rail Tips w/6mm Shank Screw = 4 Ft.Lbs. (5.4 Nm)

Assembly Notes

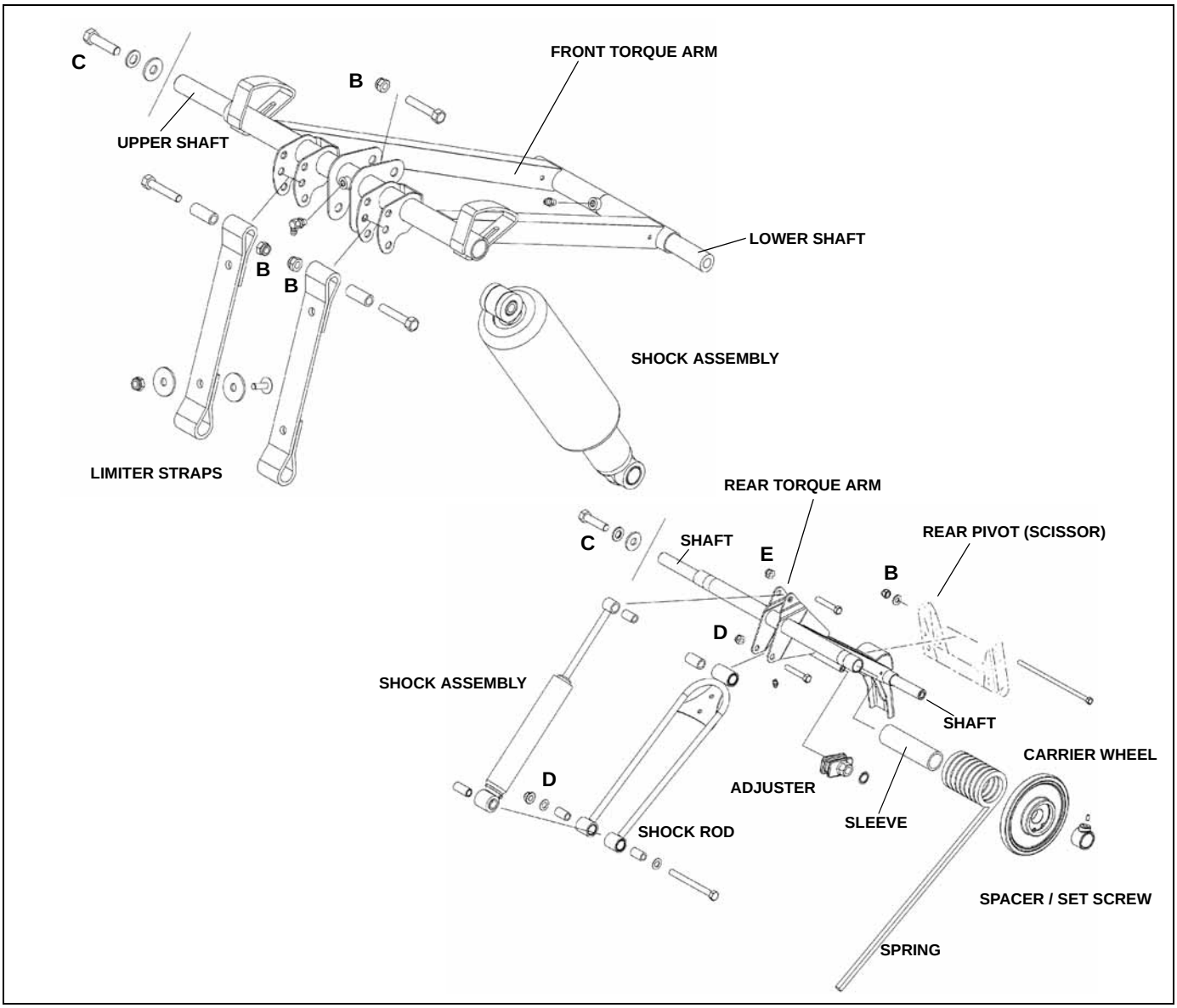
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ Switchback 144 Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 19 Ft.Lb. (26 Nm) C = 45 Ft.Lb. (61 Nm) D = 35 Ft.Lb. (47 Nm) E = 25 Ft.Lb. (34 Nm)

Assembly Notes

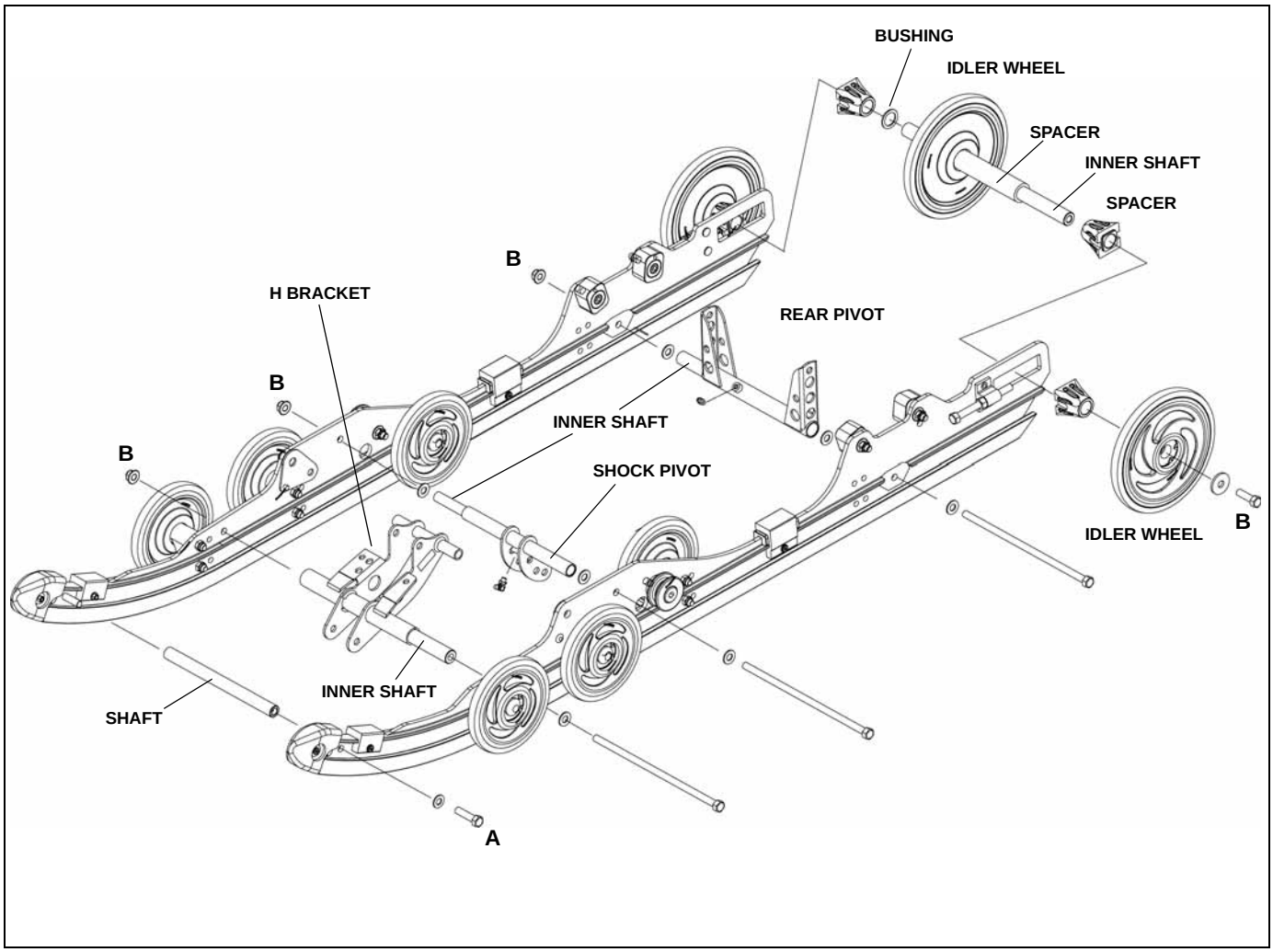
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

©2010 Polaris Sales Inc.

IQ 136 Comfort Pivots/Rear Idler



= T
A = 45 Ft.Lb. (61 Nm) B = 35 Ft.Lb. (47 Nm)

Assembly Notes

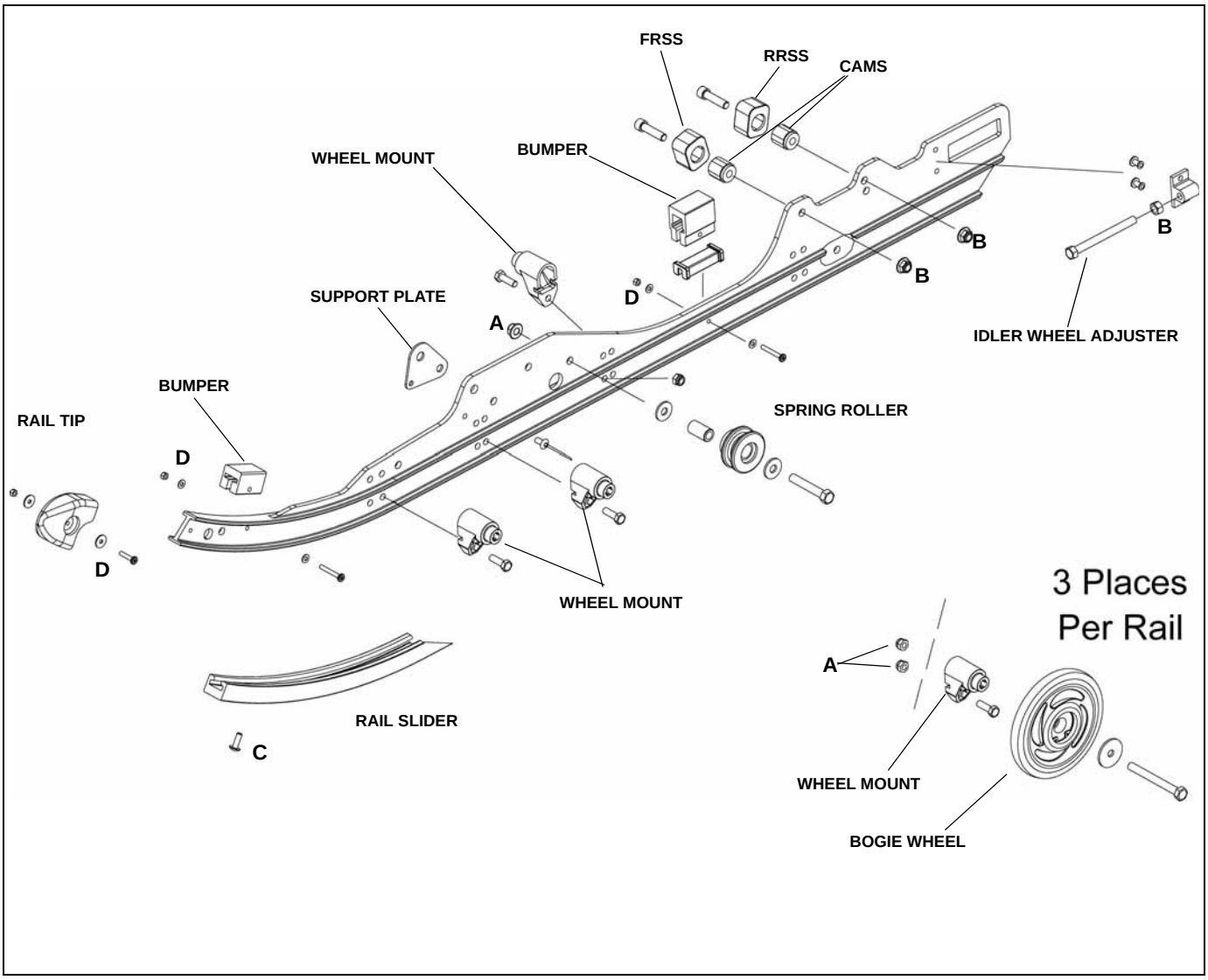
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ 136 Comfort Rail Assembly



= T
A = 19 Ft.Lb. (26 Nm) B = 35 Ft.Lb. (47 Nm) C = 3 - 6 Ft.Lb. (4 - 8 Nm) D = 35 In.Lb. (4 Nm)

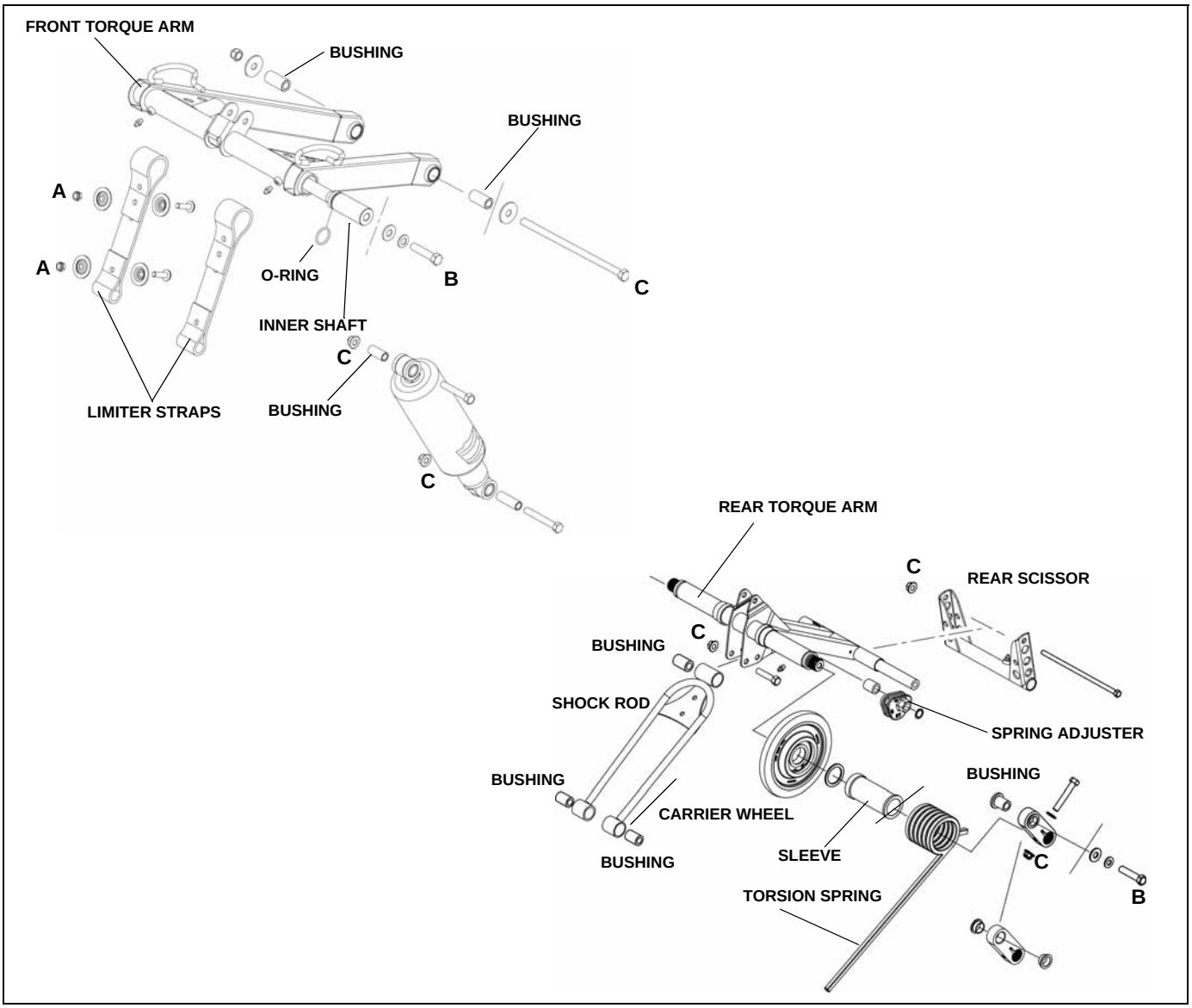
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ 136 Comfort Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 40 Ft.Lb. (54 Nm) C = 35 Ft.Lb. (47 Nm)

Assembly Notes

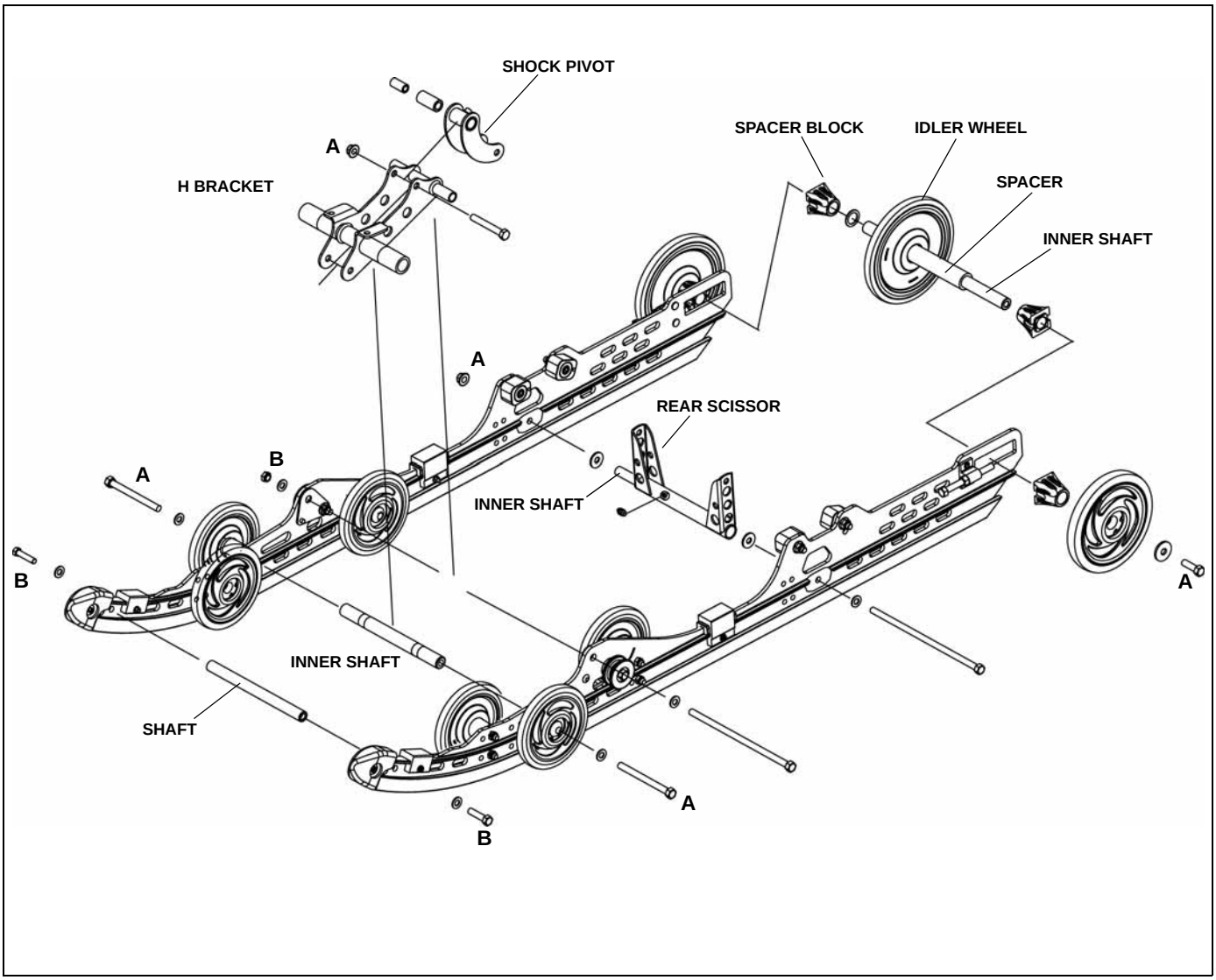
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

©2010 Polaris Sales Inc.

IQ 136 Coupled Pivots/Rear Idler



= T
A = 35 Ft.Lb. (47 Nm) B = 45 Ft.Lb. (61 Nm)

Assembly Notes

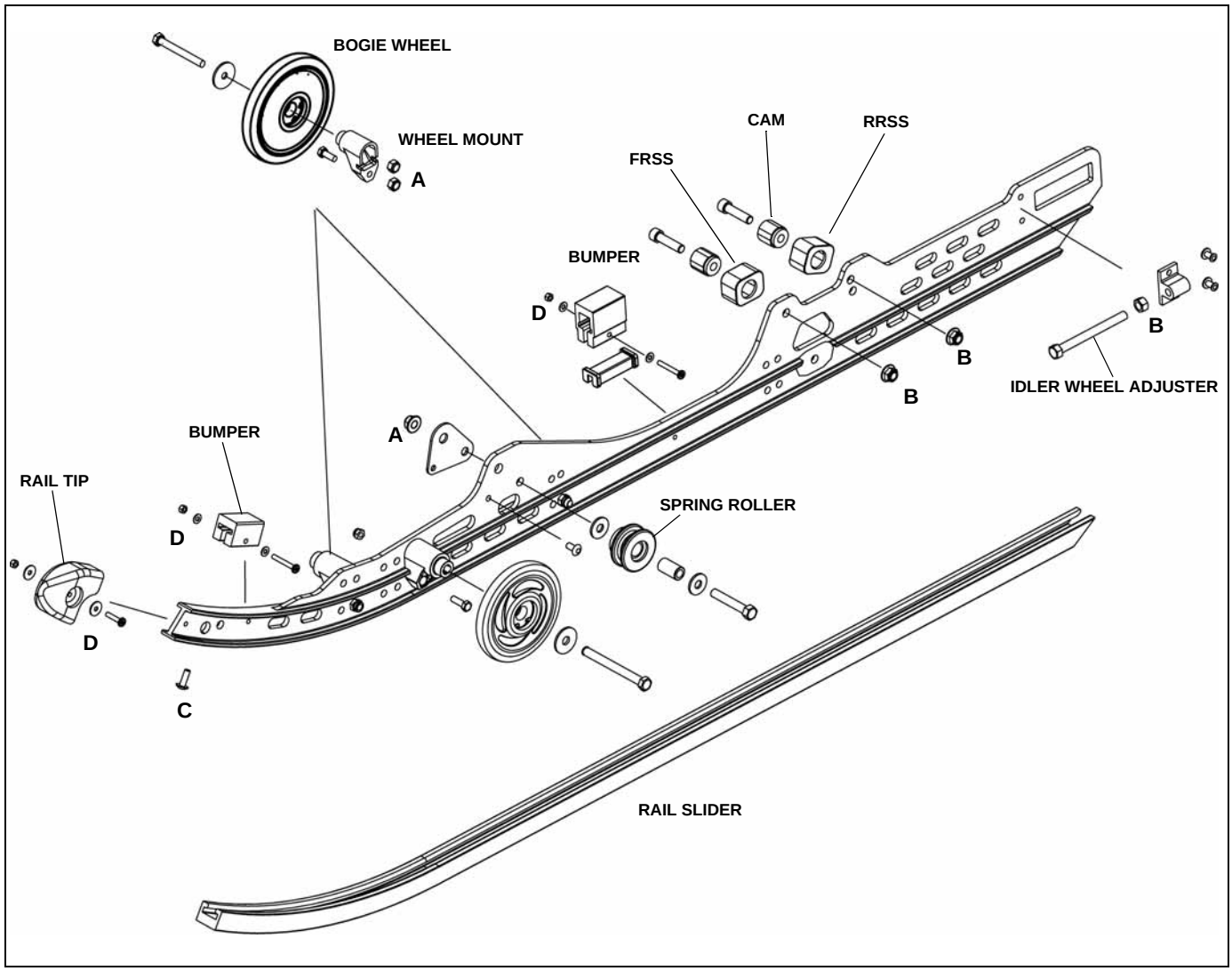
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

IQ 136 Coupled Rail Assembly



= T
A = 19 Ft.Lb. (26 Nm) B = 35 Ft.Lb. (47 Nm) C = 3 - 6 Ft.Lb. (4 - 8 Nm) D = 35 In.Lb. (4 Nm) Rail Tips w/6mm Shank Screw = 4 Ft.Lbs. (5.4 Nm)

Assembly Notes

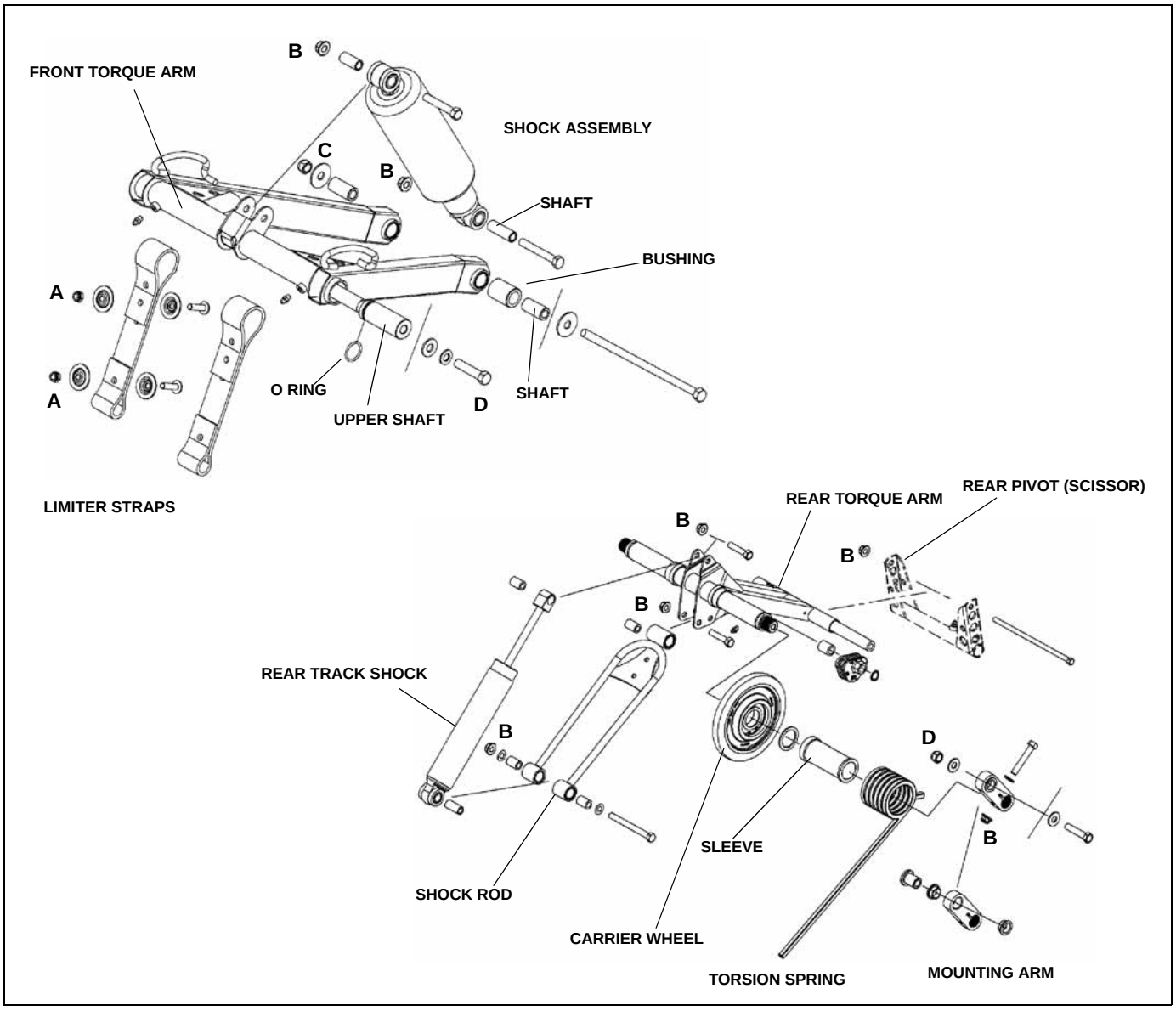
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ 136 Coupled Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 35 Ft.Lb. (47 Nm) C = 45 Ft.Lb. (61 Nm) D = 60 Ft.Lb. (81 Nm)

Assembly Notes

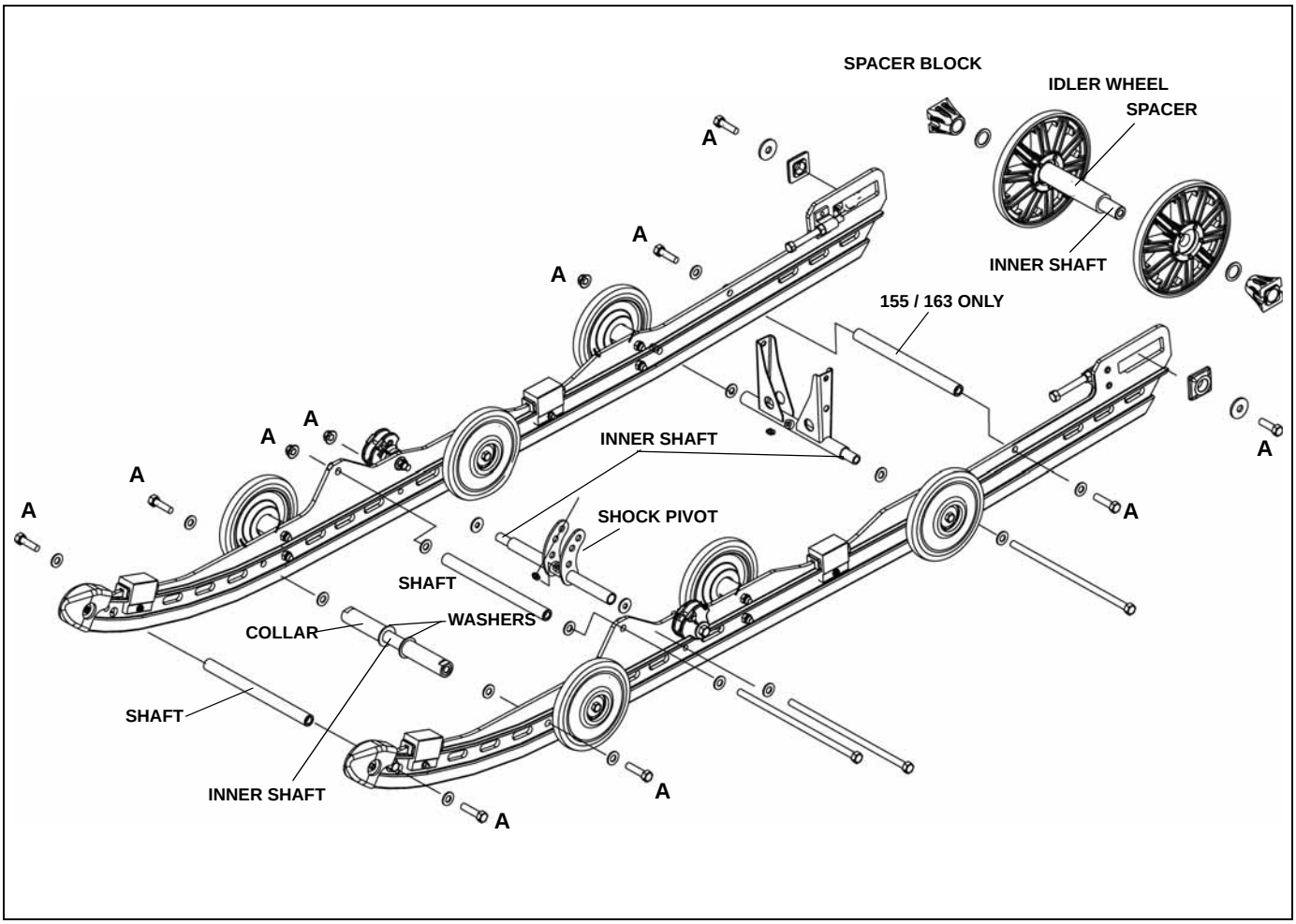
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

IQ RMK 144/155/163 Pivots/Rear Idler



= T
A = 35 Ft.Lb. (47 Nm)

CAUTION

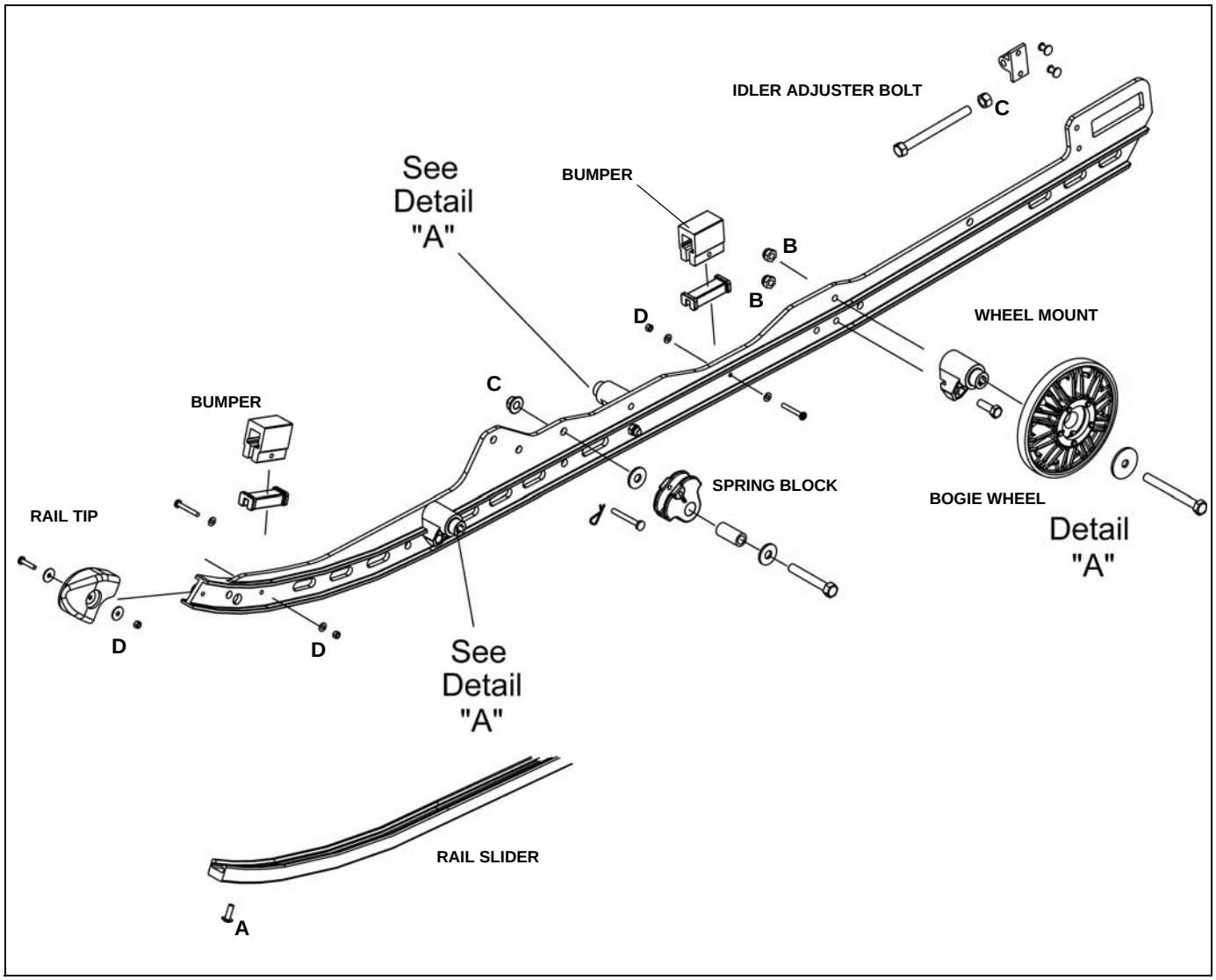
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

©2010 Polaris Sales Inc.

IQ RMK 144/155/163 Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 Ft.Lb. (47 Nm) D = 35 In.Lb. (4 Nm) Rail Tips w/6mm Shank Screw = 4 Ft.Lbs. (5.4 Nm)

Assembly Notes

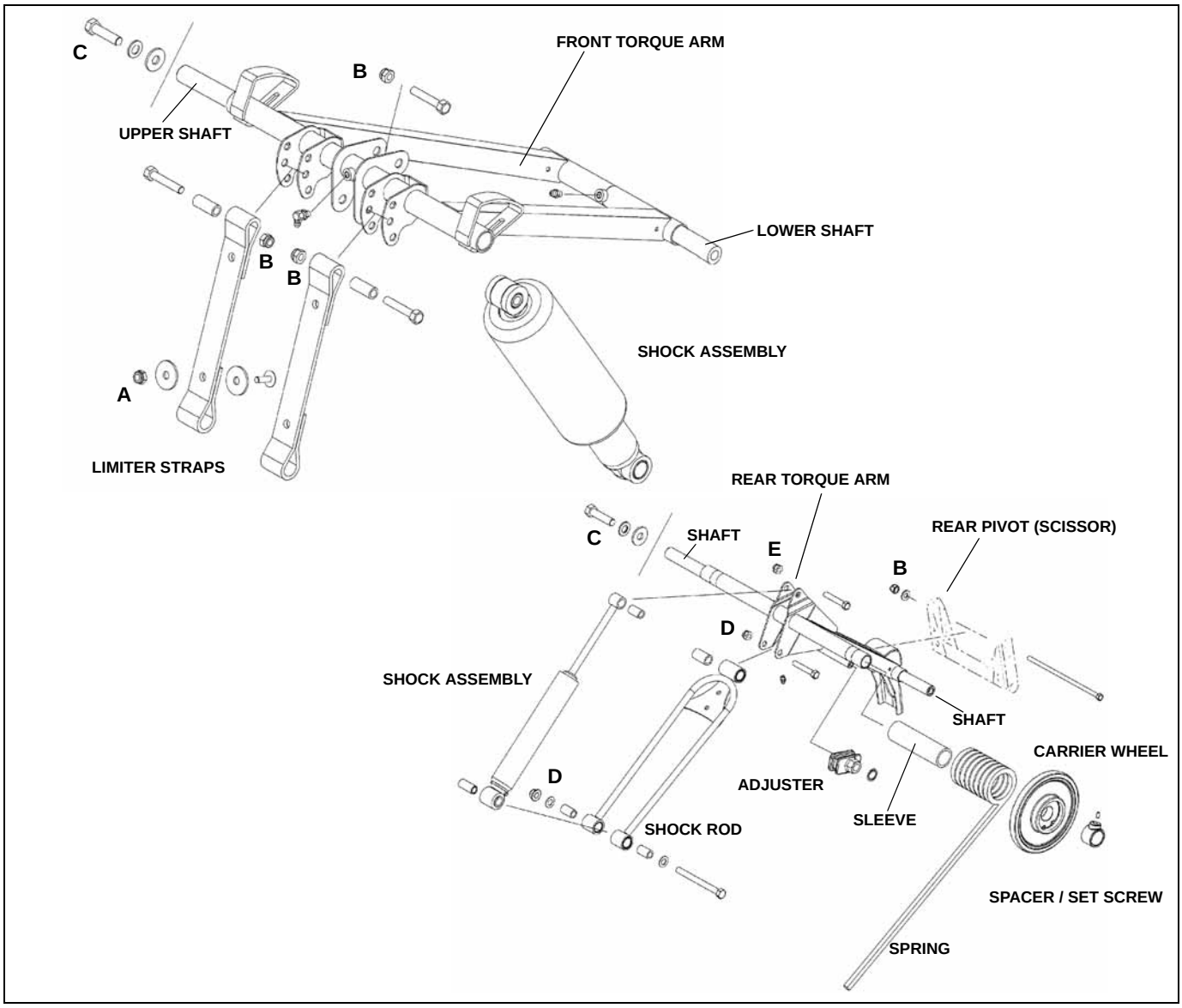
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

IQ RMK 144/155/163 Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 19 Ft.Lb. (26 Nm) C = 45 Ft.Lb. (61 Nm) D = 35 Ft.Lb. (47 Nm) E = 25 Ft.Lb. (34 Nm)

Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

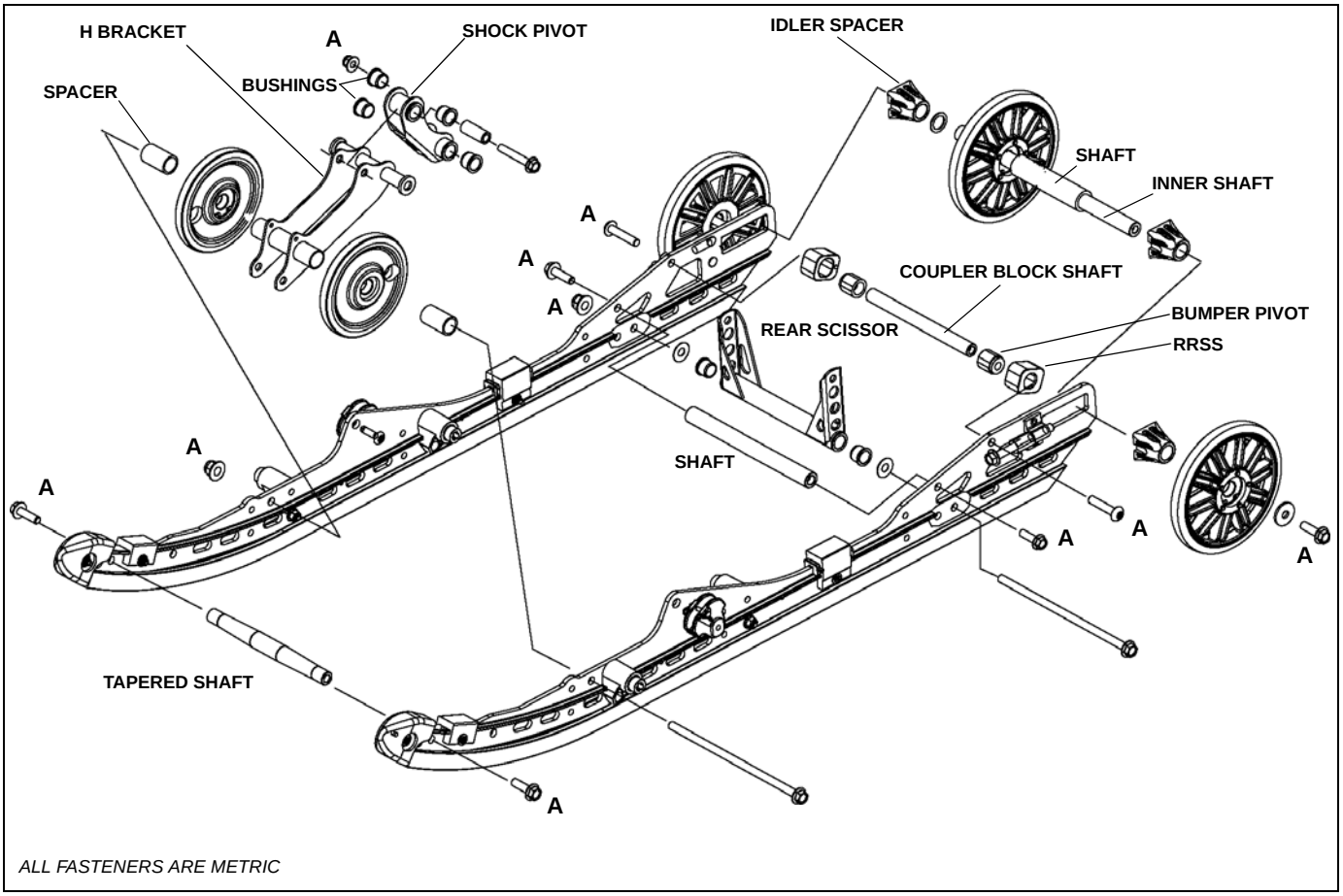
⚠ CAUTION

The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

8

©2010 Polaris Sales Inc.

IQ LWT Pivots/Rear Idler



= T
A = 33 Ft.Lb. (44.7 Nm)

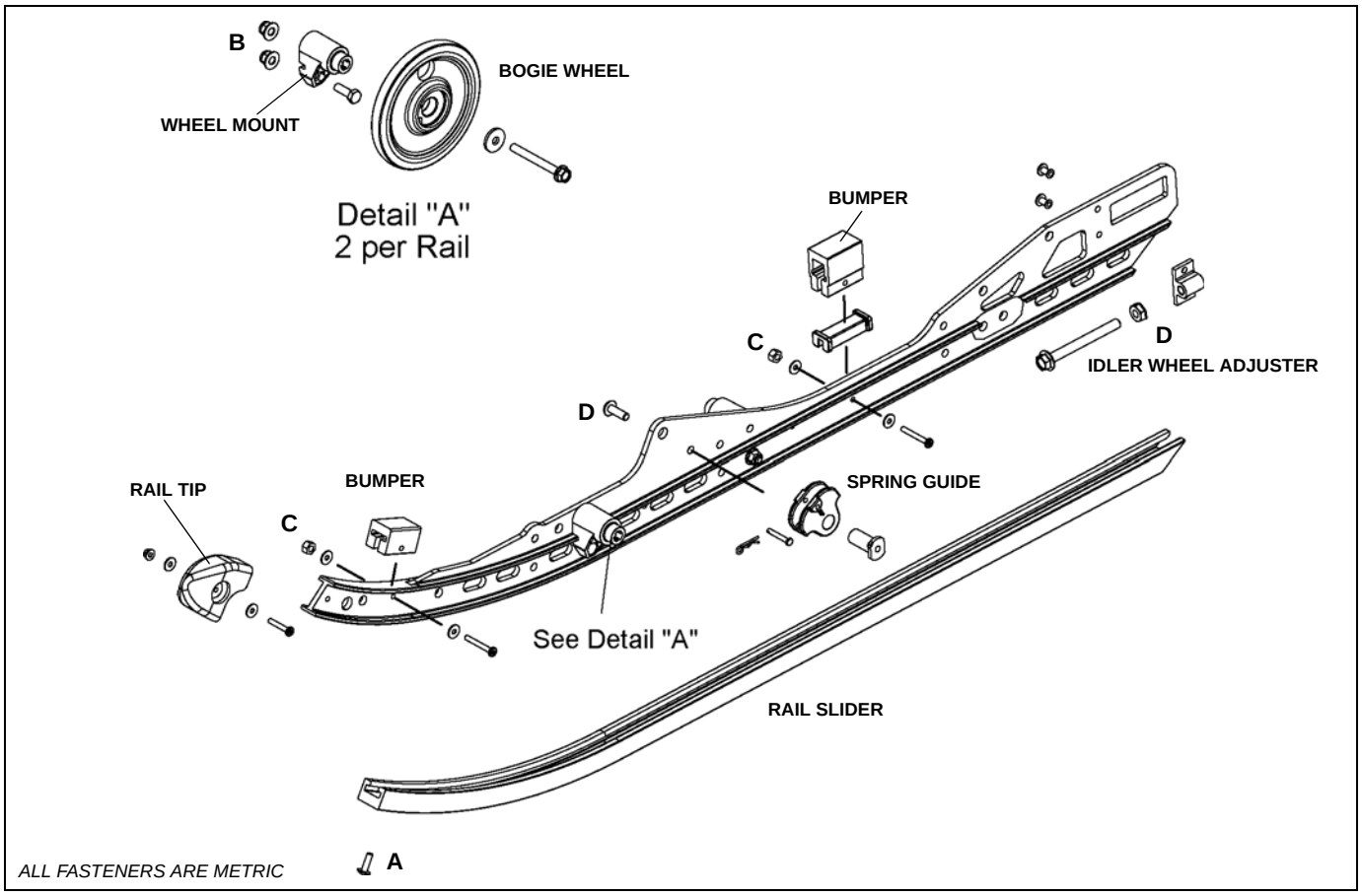
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ LWT Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 Ft.Lb. (47 Nm) D = 35 In.Lb. (4 Nm) Rail Tips w/6mm Shank Screw = 4 Ft.Lbs. (5.4 Nm)

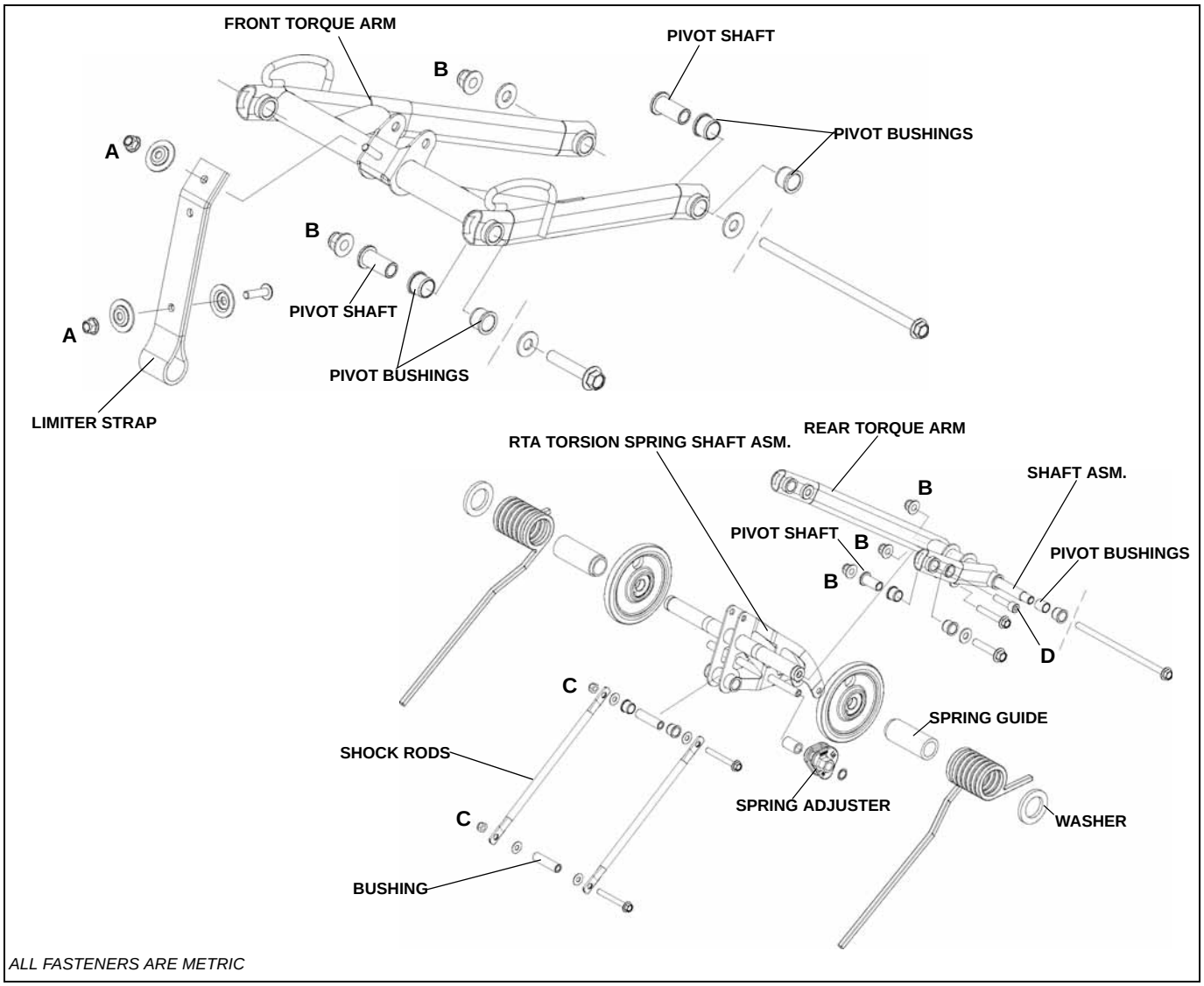
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ LWT Front/Rear Torque Arms



ALL FASTENERS ARE METRIC

= T
A = 12 Ft.Lb. (16 Nm) B = 60 Ft.Lb. (80 Nm) C = 33 Ft.Lb. (44.7 Nm) D = 40 Ft.Lb. (54 Nm) FTA Shock Bolts = 33 Ft.Lb. (44.7 Nm) RTA Shock Bolts = 33 Ft.Lb. (44.7 Nm)

Assembly Notes

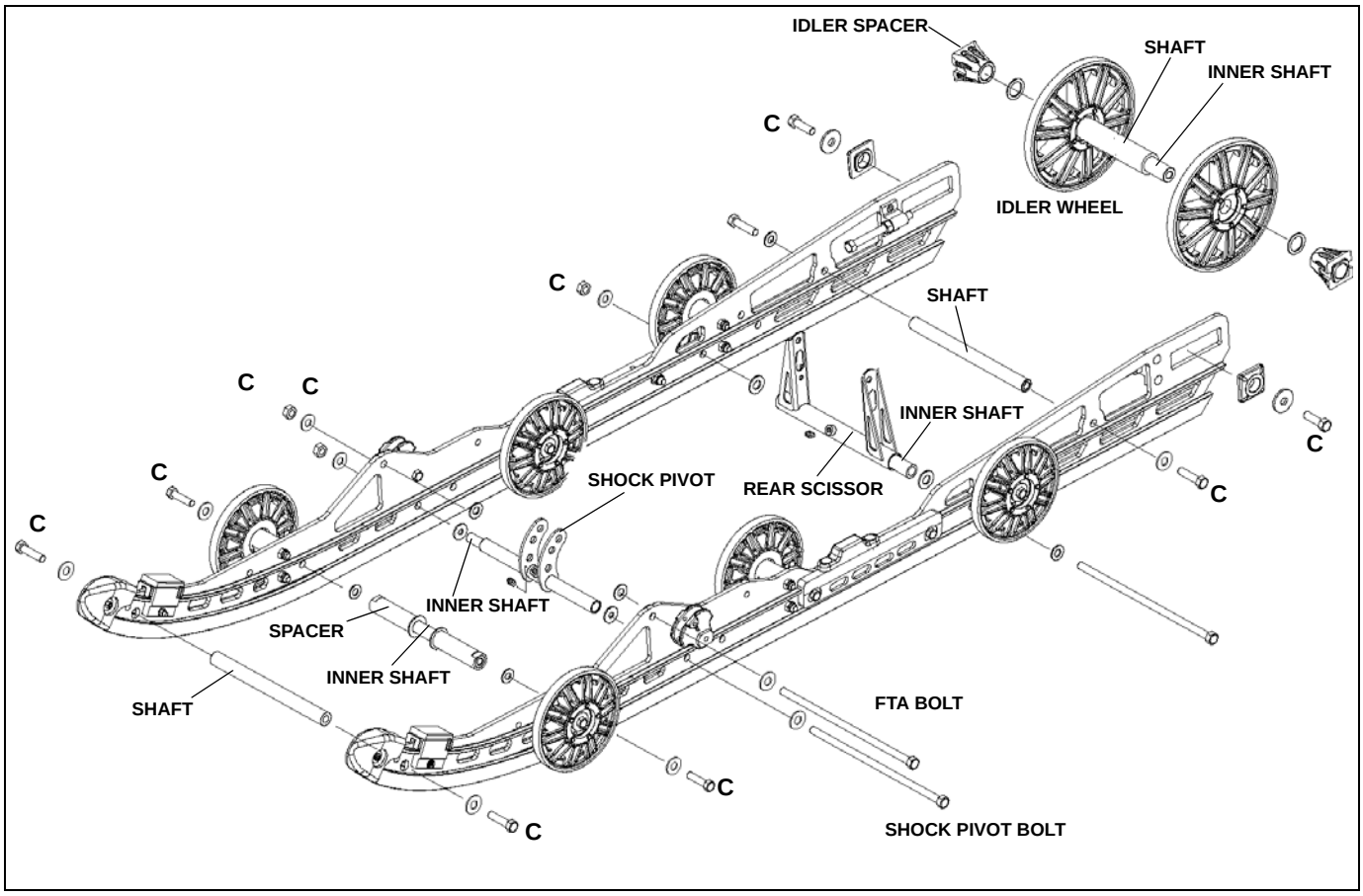
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.

⚠ CAUTION

Some of the fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

IQ Assault RMK Pivots/Rear Idler



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 Ft.Lb. (47 Nm)

Assembly Notes

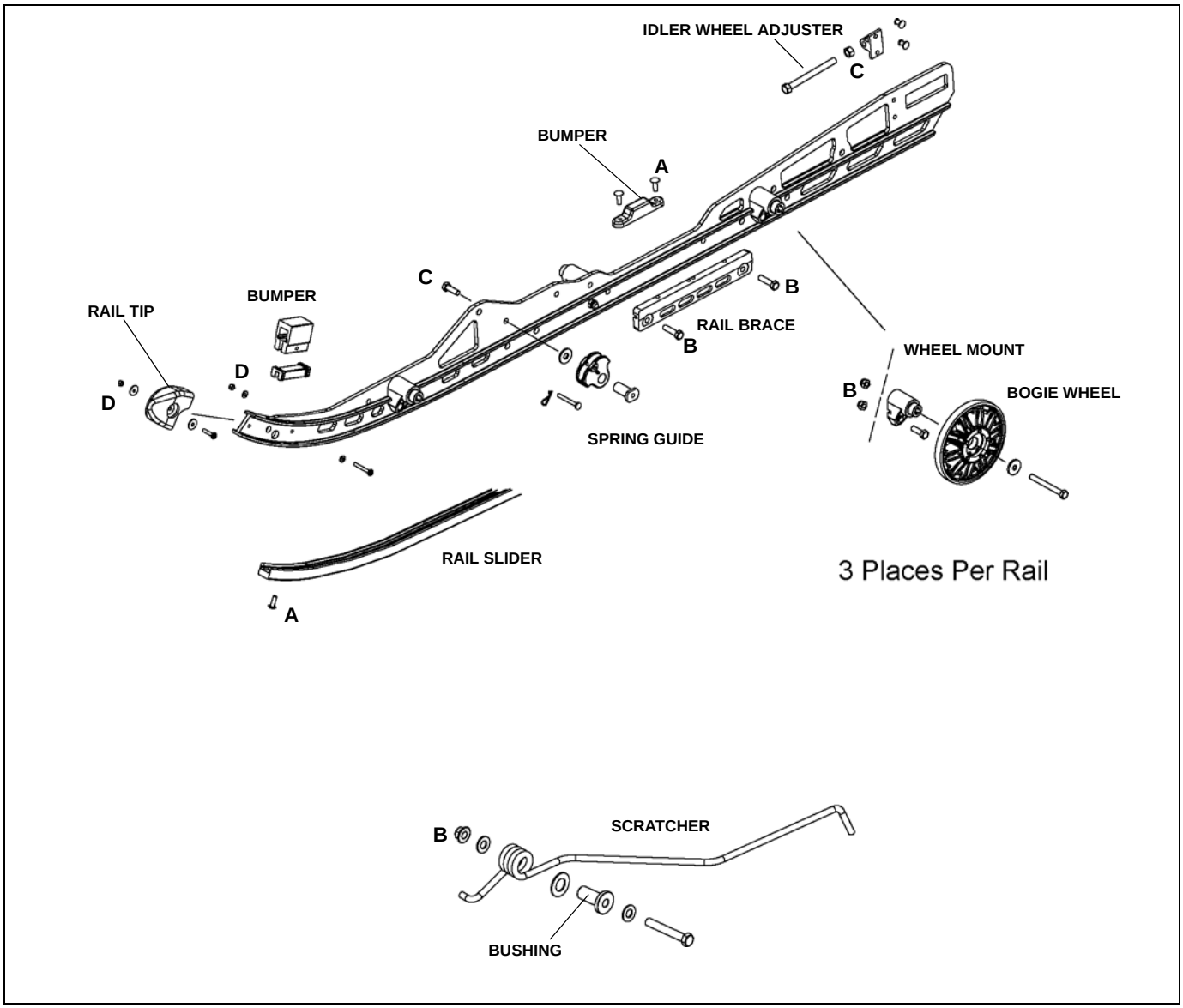
- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

IQ RMK Assault Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 Ft.Lb. (47 Nm) D = 35 In.Lb. (4 Nm) Rail Tips w/6mm Shank Screw = 4 Ft.Lbs. (5.4 Nm)

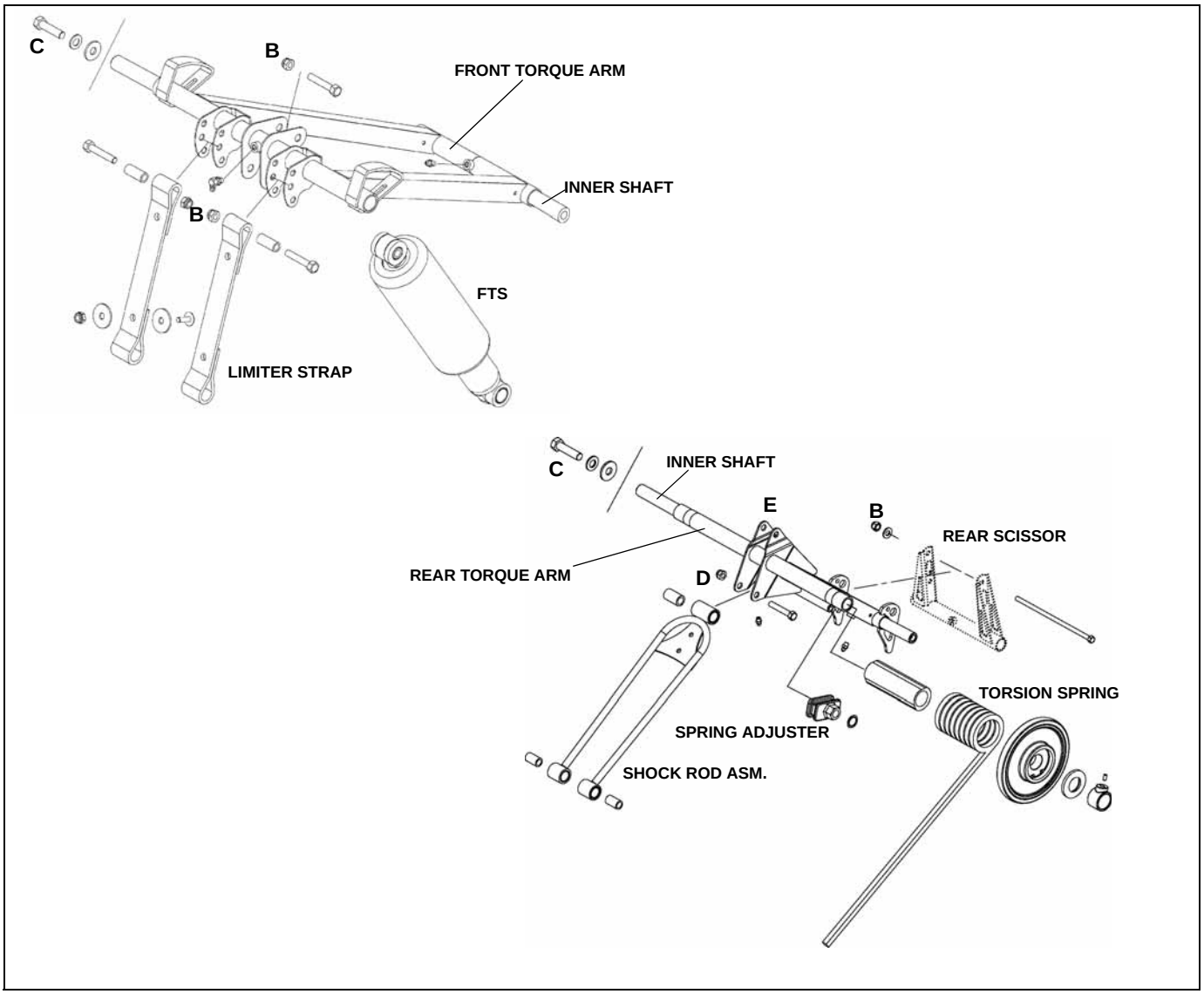
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

IQ RMK Assault Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 19 Ft.Lb. (26 Nm) C = 45 Ft.Lb. (61 Nm) D = 35 Ft.Lb. (47 Nm) E = 25 Ft.Lb. (34 Nm) FTA Shock Bolts = 19 Ft.Lb. (26 Nm) RTA Shock Bolts = 35 Ft.Lb. (47 Nm)

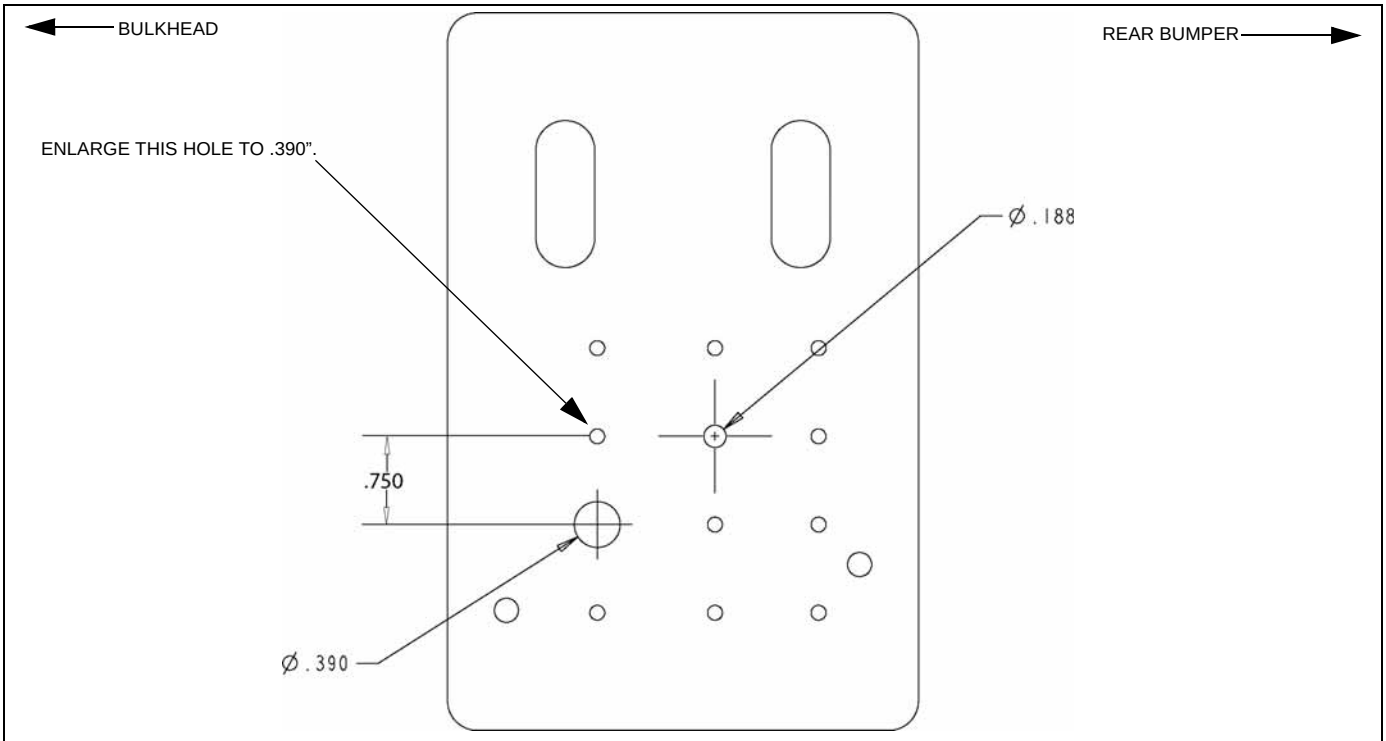
Assembly Notes

- Never re-use Nylok nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

CAUTION
The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

©2010 Polaris Sales Inc.

IQ RMK Assault “ON-Trail” FTA Mounting



RH FTA TUNNEL SUPENSION PAD AS VIEWED FROM INSIDE OF TUNNEL

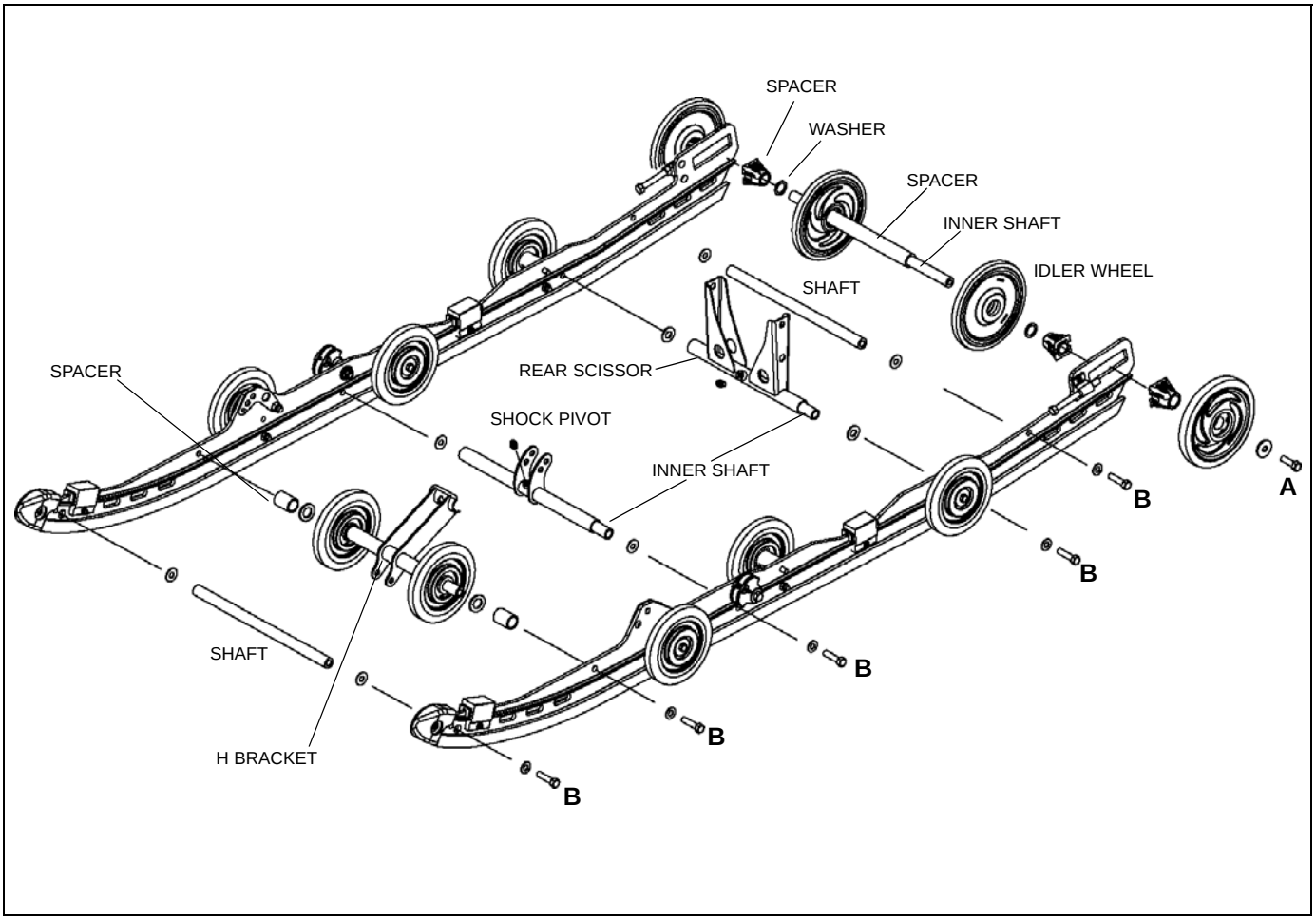
The front torque arm (FTA) can be relocated on the RMK Assault to improve the vehicle’s trail handling characteristics.

The optional mounting location is the hole .750 in. (19.05mm) above the stock mounting hole. Enlarge the existing hole to .390 inches (9.90mm).

Relocating the FTA to the upper mounting location lowers the vehicle’s overall center of gravity without shortening the FTA limiter straps. This has the effect of increasing ski pressure while maintaining full front track shock motion.

©2010 Polaris Sales Inc.

Widetrak IQ 156 Pivots/Rear Idler



= T
A = 35 Ft.Lb. (47 Nm) B = 45 Ft.Lbs. (61 Nm)

Assembly Notes

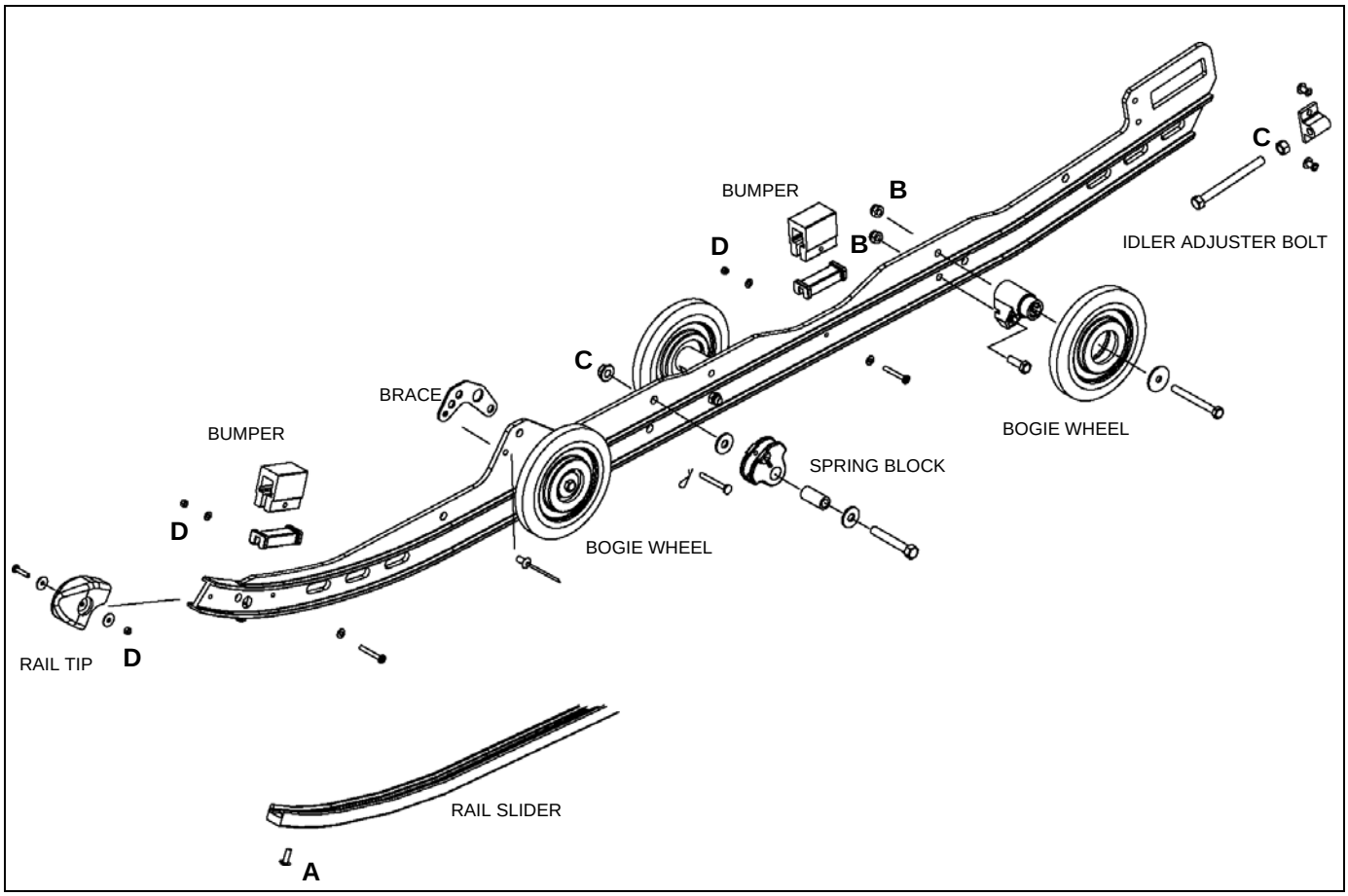
- Never re-use Nylock nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.
- Washers must be installed as shown in illustration.

⚠ CAUTION

Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

©2010 Polaris Sales Inc.

Widetrak IQ 156 Rail Assembly



= T
A = 3 - 6 Ft.Lb. (4 - 8 Nm) B = 19 Ft.Lb. (26 Nm) C = 35 Ft.Lb. (47 Nm) D = 35 In.Lb. (4 Nm)

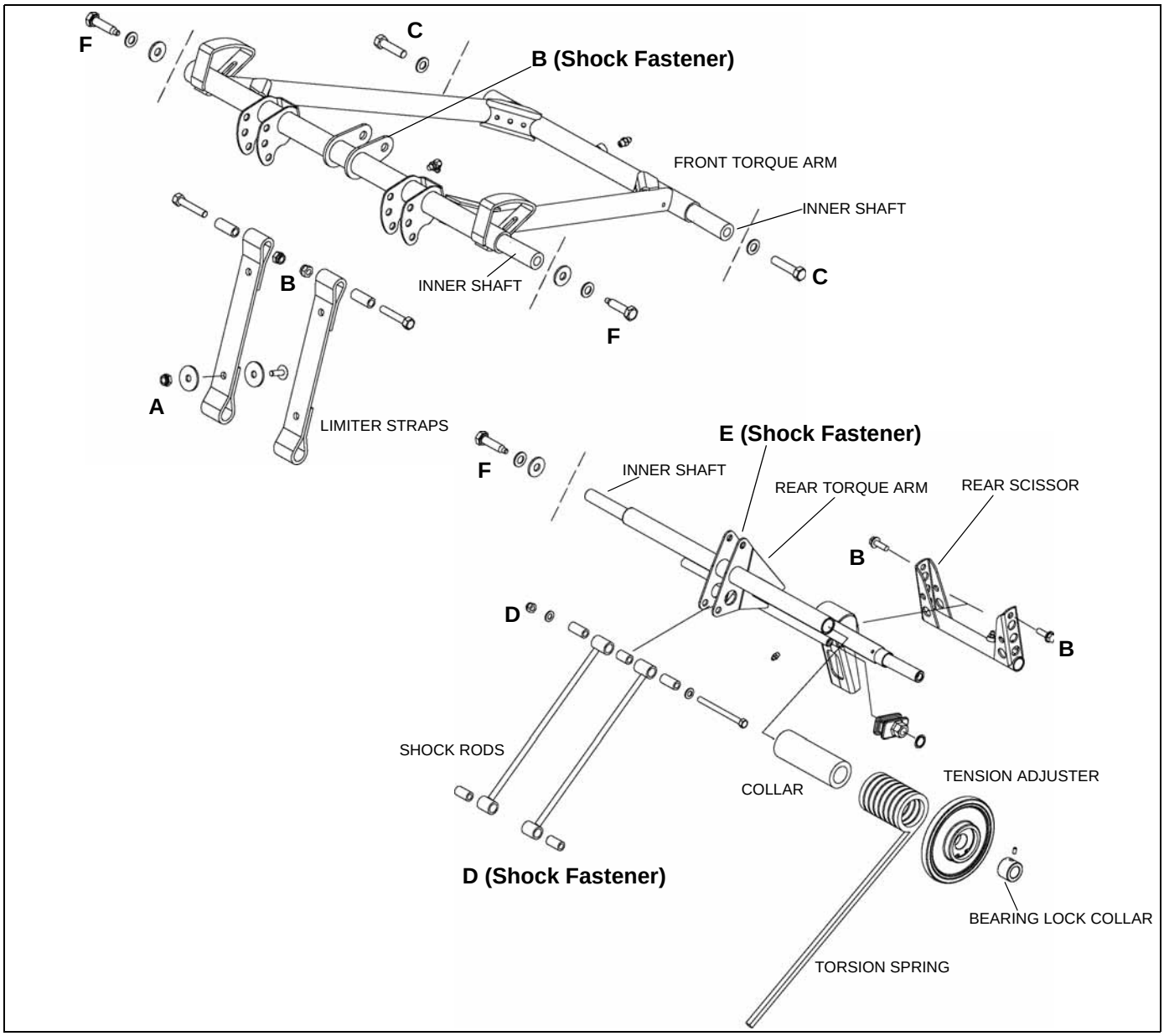
Assembly Notes

- Never re-use Nylock nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION
Some rail shaft fasteners are pre-coated with locking agent. Never re-use these fasteners once removed. Always use new pre-coated fasteners.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

Widetrak IQ Front/Rear Torque Arms



= T
A = 12 Ft.Lb. (16 Nm) B = 19 Ft.Lb. (26 Nm) C = 45 Ft.Lb. (61 Nm) D = 35 Ft.Lb. (47 Nm) F = 60 Ft.Lb. (81 Nm)

Assembly Notes

- Never re-use Nylock nuts. Always replace with new parts.
- All pivots must rotate freely after tightening fasteners.
- Apply Polaris Premium All Season Grease to all grease zerks as outlined in the periodic maintenance table.

⚠ CAUTION

The fasteners securing the rear suspension to the tunnel are pre-coated with a locking agent when new. Never re-use these fasteners when removed. Always use new pre-coated fasteners when mounting the suspension to the tunnel.

©2010 Polaris Sales Inc.

REAR SUSPENSION OPERATION

Operation

The primary function of the rear suspension is to provide a comfortable ride in all types of riding conditions. It separates the rider from the ground, while allowing for complete vehicle control. The rear suspension also must provide weight transfer and maintain track tension.

Rear suspensions have many adjustable features for fine tuning to achieve optimum comfort. The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. However, suspension adjustments always involve compromises. A rear suspension set up to perform well in moguls would not suit the preference of a groomed trail rider.

Weight Transfer

The shifting of weight from the skis to the track is called weight transfer. As engine torque is applied to the drive axle, the torque is transferred to the track, pulling it forward. This energy also tries to pull the suspension forward. The front torque arm reacts to this force by pushing down on the front of the track, in effect applying more weight to the front of the track and reducing the weight on the skis. It is important to note that energy used to lift the front of the machine is not available to push the vehicle forward.

Changing the angle of the front torque arm changes the suspension's reaction to the force. Adjusting the length of the limiter strap will change the front torque arm angle. Shortening the strap limits the extension of the front of the suspension; reducing the angle of the torque arm and increasing ski pressure during acceleration. Lengthening the strap allows the front of the suspension to extend further; increasing the angle of the torque arm and decreasing ski pressure during acceleration. Limiter strap adjustment has a great affect on weight transfer. Limiter straps only affect acceleration. It is important to check track tension whenever limiter strap length is changed.

Front track shock spring preload also affects weight transfer. A stiffer spring and/or more preload on the spring transfers more weight to the track. A softer spring and/or less preload keeps more weight on the skis. Keep your riding application in mind when choosing springs and setting spring preload. Soft springs/preload will increase ski pressure, but may bottom out. Stiff springs/preload will provide more track pressure (reduced ski pressure), but may result in a less comfortable ride

During acceleration, the rear of the suspension will compress and the IFS will extend, pivoting the machine about the front torque arm. Because of this pivoting effect, rear spring and spring preload also have some effect on weight transfer. Softer rear springs, or less preload, allow more weight transfer to the track and reduce ski pressure. Stiffer rear springs, or increased preload, allow less weight transfer to the track and increase ski pressure. The main function of the rear torque arm is to support the weight of the vehicle and rider, as well as to provide enough travel to absorb bumps and jumps.

Shock valving also has an effect on weight transfer. Refer to shock tuning information in this chapter. Scissor stops also affect weight transfer. See scissor stop information also in this chapter.

Coupling

On all Polaris snowmobile rear suspensions, there are two torque arms that control the movement of the rail beam. Prior to the advent of suspension coupling, these torque arms could move independently of each other. Rear suspension coupling links the movement of the front and rear torque arms to each other.

The front rear scissor stop (FRSS) couples the movement of the front torque arm with the rear torque arm and limits the amount of independence between the movement of the front torque arm and the rear torque arm.

When hitting a bump, the front torque arm starts to compress. The FRSS links that movement to the rear torque arm, causing it to compress and raise the rear suspension up as one, allowing the suspension to hit the bump only once and eliminating kickback. The factory setting are usually adequate for all riders in all conditions.

The rear-rear scissor stop (RRSS) couples the movement of the rear torque arm with the front torque arm and limits the amount of independent movement between the rear torque arm and the front torque arm.

Adjusting the RRSS to a lower setting allows more weight to transfer to the rear for more traction.

Adjusting the RRSS to a higher position will reduce weight transfer, improve chatter bump ride and improve cornering performance.

©2010 Polaris Sales Inc.

REAR SUSPENSION ADJUSTMENTS

Adjustment Procedures

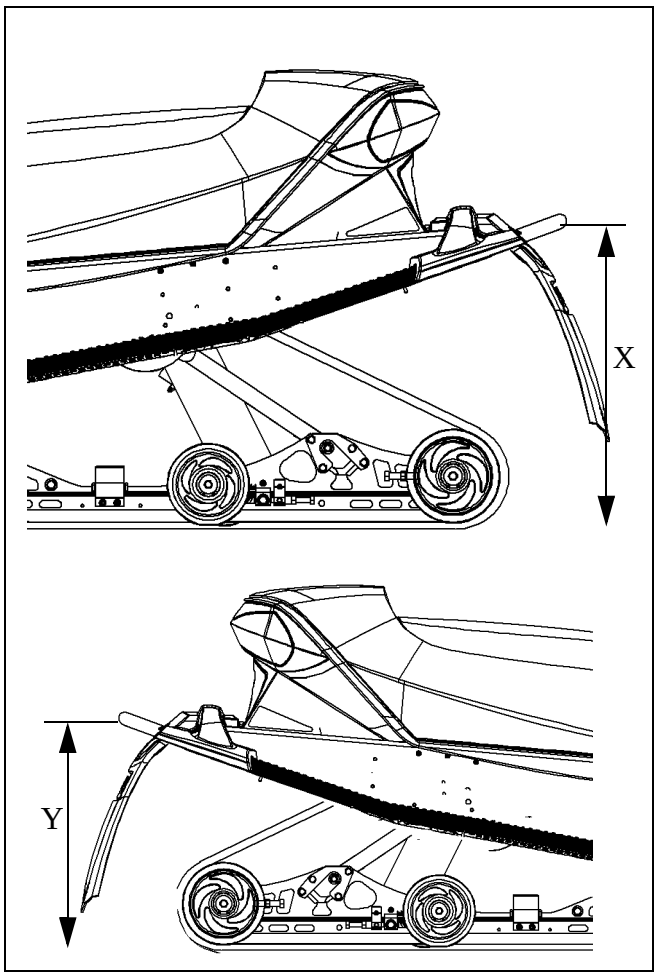
NOTE: Break-in the suspension for at least 150 miles (240 km) before making adjustments.

All settings will vary from rider to rider, and are dependant on rider weight, vehicle speed, riding style, and trail conditions. Always start with the factory settings. Make individual adjustments to suit rider preference. The machine should be methodically tested under the same conditions after each adjustment (trail and snow conditions, vehicle speed, riding position, etc.) until a satisfactory ride is achieved. Adjustments should be made to one area at a time, in order to properly evaluate the change.

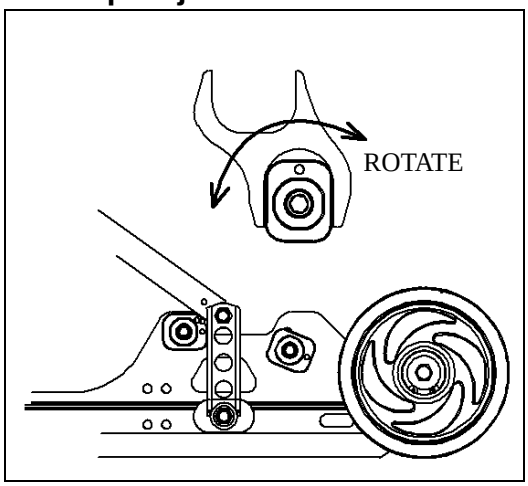
Rear Suspension Ride Height

1. To set up the rear suspension torsion spring preload, measure the distance between the ground and rear bumper with out the rider on the seat and the suspension at full extension. This can be achieved by lifting the rear of the machine so that the suspension is off the ground and carefully setting the machine down. Write this down as measurement “X”.
2. Have the rider in full gear drop down on the seat, work the suspension slightly by bouncing up and down and sit in the seated riding position. With the rider in the seated position measure from the ground to the bumper in the same spot as you did for measurement “X” and write it down as measurement “Y”.
3. To determine the correct ride height, subtract measurement X from measurement Y. (X - Y = ride height).
4. The ideal ride height is:
   - IQ 121 / 136 = 4-5”(10-13cm)
   - IQ RMK / Switchback / Widetrak = 5” (13cm)
   - IQ M-10 = 3-4” (8-10cm)
5. Adjust for the desired ride height by rotating the torsion spring cams located on the rear of the torsion spring.

If the rear suspension ride height cannot be adjusted to the correct dimension, optional torsion springs may be required. This is only an initial setup, and final spring preload may vary based on rider preference and riding conditions.



Scissor Stop Adjustment



The front rear scissor stop (FRSS) controls the bump attitude of the rear suspension. As the front torque arm (FTA) hits the bump, it forces the rear scissor to collapse a predetermined amount, depending on the FRSS block position.

©2010 Polaris Sales Inc.

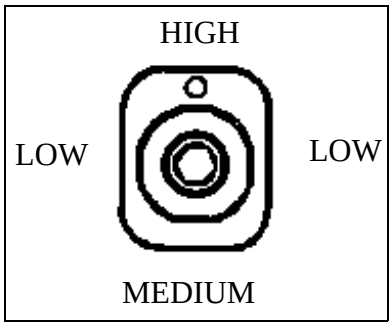
This accomplishes two important things. First, it allows a lighter spring rate on the FTA because it can borrow spring rate from the rear torsion springs. Second, it prepares the rear portion of the suspension for the bump, reducing secondary kick back.

The FRSS is made of a resilient material allowing smooth action and preventing any suspension component damage.

The RRSS controls weight transfer from the rear suspension to the skis. It also influences the stiffness of the ride by controlling the amount of coupling action between the front and rear torque arms. To decrease weight transfer, the RRSS should be set in the high position.

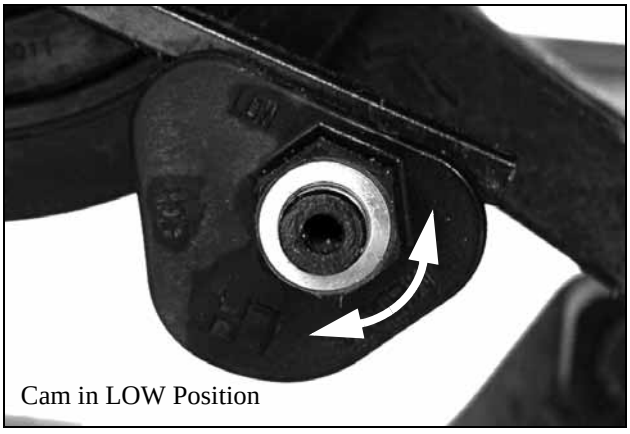
The RRSS can be removed for maximum weight transfer. However, unless the torsion springs and rear shock valving are changed, the ride will be compromised. Always maintain equal adjustment on both sides.

The dot is an indicator of the HIGH position. The sides are the LOW position and the bottom is the MEDIUM position.

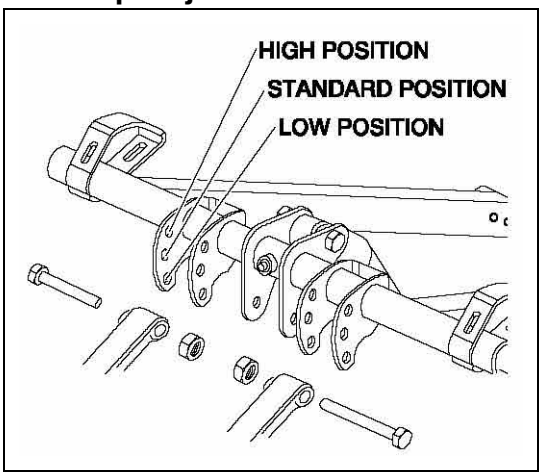


Torsion Spring Adjustment

To adjust the rear torsion spring, rotate the adjuster cam to the desired adjustment. The cam has three sides, LOW, MEDIUM and HIGH.


Cam in LOW Position

Limiter Strap Adjustment



One method of changing ski-to-snow pressure is to change the length of the front limiter straps.

- Lengthening the straps decreases ski pressure under acceleration.
- Shortening the straps increases ski pressure under acceleration.

Set up Recommendations for Optimum Performance (RMK / Switchback Rear Suspensions)

- DEEP POWDER SNOW: Limiter strap in LOW position for maximum lift and flotation
- POWDER-HARDPACK: Limiter strap in STANDARD position for overall handling and speed over snow.
- HARDPACK: Limiter strap in HIGH position for increased control and less transfer.

©2010 Polaris Sales Inc.

M-10 SUSPENSION

M-10 OVERVIEW

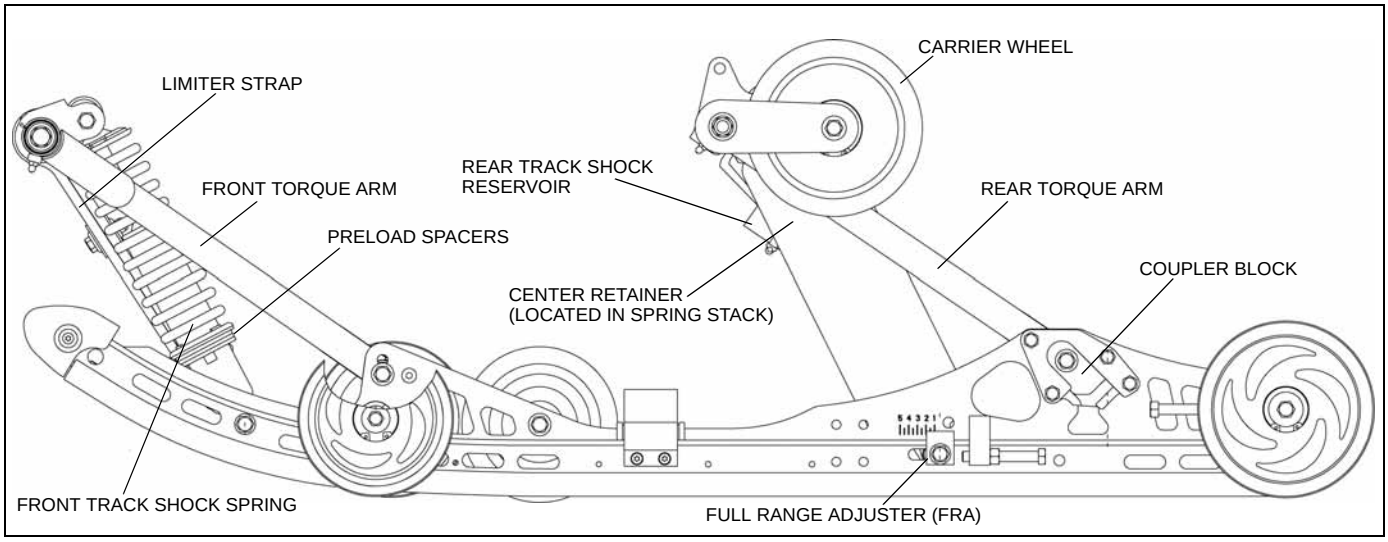
The FAST M-10 rear suspension has been designed and set up to deliver a soft ride under average riding conditions. Rider weight, riding styles, trail conditions, and vehicle speed each affect suspension action.

The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. It should be noted, however, that suspension adjustments involve a compromise or trade off. A machine set up to perform well in the moguls would not suit the preference of a groomed trail rider.

M-10 ADJUSTMENTS

- Full Range Adjuster (FRA)
- Center Retainer

IMPORTANT: The M-10 rear suspension has been designed to be very sensitive to rider weight. Changes in rider weight of 25 lbs. or more may require appropriate changes in FRA settings.



M-10 TERMINOLOGY

- **Coupler Blocks:** Plastic blocks located at the rear of each rail. Blocks facilitate the couple function.
- **Full Range Adjuster (FRA):** FRA refers to the adjustable lower rear shock attachments. Changing the FRA location has two effects on tuning. First, moving the shock forward increases shock speed, resulting in firmer damping on compression and rebound. Second, it also increases the effect of the rear spring by displacing it further.
- **Sag Settings:** The difference in rear bumper height from the sleds fully extended position to its lower height with the rider seated on the sled.

9922854 - 2007-2011 IQ Service Manual
©2010 Polaris Sales Inc.

M-10 ADJUSTMENTS

The primary adjustment on the M-10 suspension is the Full Range Adjustment (FRA). Adjusting the FRA will have the MOST effect on rear suspension performance.

Polaris recommends that you allow between 25 to 200 miles for the suspension to break in before performing any adjustments to the suspension.

M-10 128

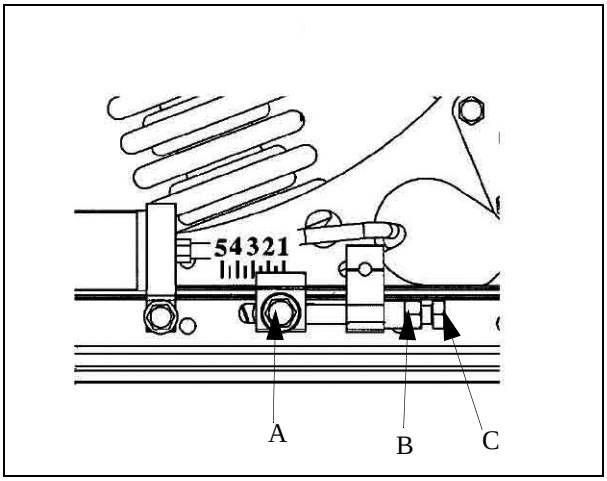
Rider weight with gear (lbs.)	Suggested FRA Range (Lower number is softer)
Under 100	1 to 1 1/2
100-150	1 1/2 to 2
150-200	2 to 2 1/2
200-250	2 1/2 to 3
250-300	3 to 3 1/2
300-350*	3 1/2 to 4
Over 350*	4 to 5

M-10 136

Rider weight with gear (lbs.)	Suggested FRA Range (Lower number is softer)
Under 100*	1 to 1 1/2
100-150*	1 1/2 to 2
150-200*	2 to 2 1/2
200-250	2 1/2 to 3
250-300	3 to 3 1/2
300-350	3 1/2 to 4
Over 350	4 to 5

*=Optional rear track middle spring retainer available. See Optional Retainer Table

M-10 FRA INITIAL SET UP REFERENCE



Adjusting the FRA will have the MOST effect on the rear suspension performance. To adjust the FRA:.

1. Refer to the initial set-up reference chart (see Table and Table) to determine the desired FRA position.
2. To adjust, loosen the hex bolts (A) attaching the rear lower shock cross shaft to the rail beam.
3. Using a 9/16" wrench, loosen the jam nuts (B) on the preload bolts.
4. Adjust the preload bolts (C) to the desired FRA position.
5. Tighten the jam nuts.

NOTE: Make sure the preload bolt contacts the slide block before tightening the jam nut.

6. Tighten the hex bolts and torque to 35 ft. lbs. (47 Nm)

NOTE: When the M-10 suspension is new, it will take 25 to 200 miles (40-300 km) to properly break in the springs and shocks, at which time the suspension will be softer and may require FRA adjustment.

©2010 Polaris Sales Inc.

M-10 REAR SPRING PRELOAD

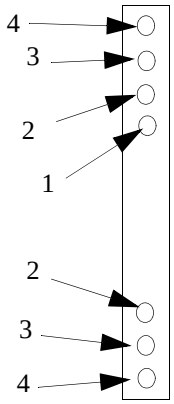
If FRA position alone does not allow the setup of the proper amount of sag, the center retainer of the rear track shock can be replaced with optional retainers to adjust the preload and change the sag.

Optional Retainers

Retainer insert Part Number	Retainer part Number	Preload	Sag
5436109	5135077 (std. on M10/128)	Least	Most
	5134923	Middle	Middle
	5135080 (std. on M10/136)	Most	Least

NOTE: Whenever ordering any of the retainers listed in the chart, always order the retainer insert as well. The insert is not removable once installed, so a new insert is needed when installing a new retainer.

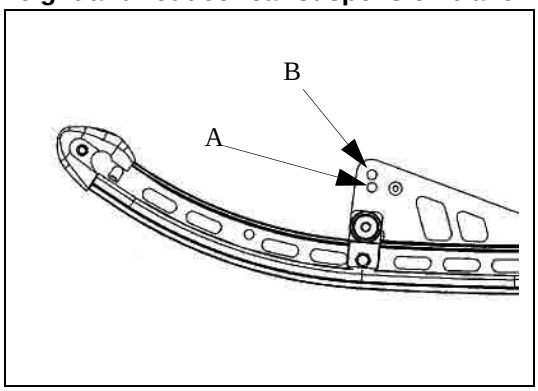
M-10 SKI PRESSURE



Ski pressure is set at the factory to deliver the optimum balance between ride and handling. If a rider prefers more ski pressure for improved steering performance, adjustments can be made to the front limiter strap and front arm mount.

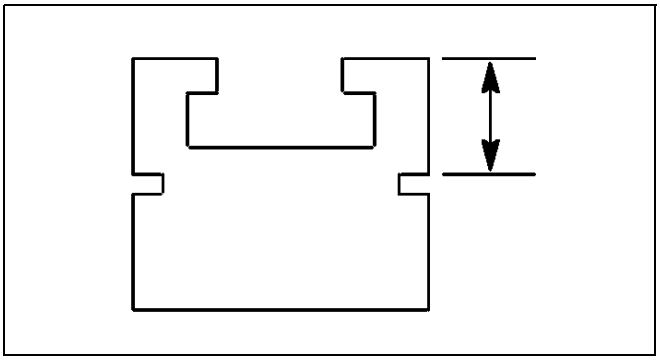
1. Determine if the rider prefers comfort or control. Lean toward the #4 setting for comfort and toward the #3 setting for aggressive riding.
2. For full hole adjustments, remove the 5/16" nut and flat washers from the lower attachments of the limiter straps and relocate the straps to the desired position (i.e. move from position 4 to 3). Replace the nut and washer. Tighten securely.
3. For half-hole increments (such as 3/4), the limiter straps have slots at the upper pinch bolt. These slots allow the bolts to be loosened (rather than removed) for half-step adjustments. Re-tighten the pinch bolts.
4. There are also two front arm mounting holes in the slide rail that can adjust ski pressure. The lower hole (A) increases ski pressure while the upper hole (B) decreases ski pressure.

NOTE: By design, the BIASED COUPLE design of the M-10 suspension displaces the rear arm as the front arm is compressed. This means that when you raise the front limiter strap, at some point you will collapse the rear suspension arm, which will affect SAG height and reduce rear suspension travel.



RAIL SLIDERS

Wear Limit



Replace sliders when wear exceeds notch. If sliders look “wavy” in appearance, check and adjust track tension or consider adding more bogie wheels.

Removal

1. Remove the rear suspension.

NOTE: Some models may allow the rail sliders to be removed by sliding it through track windows with the suspension mounted in the machine.

2. Remove front rail slider retaining bolt, located at the rail tip.
3. Use a block of wood or a drift punch and hammer to drive the slider rearward off the slide rail.
4. With the rail slider at room temperature, install a new rail slider by reversing steps 1 - 3.

NOTE: Lightly coat rail slider track clip area with a lubricant such as LPS2 or WD-40 to ease installation.

©2010 Polaris Sales Inc.

Break-In

After installing new rail sliders they must be “broke in” for longer life and better wear patterns. When performing the breaking in procedure ride the sled on a surface that has adequate snow conditions with deeper snow nearby. Run the sled on the adequate snow surface and dip into the deeper snow every so often.

REAR SUSPENSION REMOVAL AND INSTALLATION

Removal

1. Support the rear of the machine so that the track is off the floor.
2. Loosen the rear idler bolts, then push the rear idler shaft toward the front of the machine.
3. Carefully release the torsion spring pressure (if equipped).
4. Remove the support from the tunnel letting the suspension carry the weight of the machine.
5. Remove the fasteners securing the skid to the tunnel.
6. Place a protective mat on the floor and tip the unit over on the left side, supporting the sled on the end of the handlebar.
7. Collapse the torque arms, and remove the suspension from the tunnel.

Installation

⚠ CAUTION
Always use new fasteners when securing the torque arms to the tunnel.

1. With the unit on its left side, place the suspension in the tunnel.
2. Align the front and rear torque arms with the tunnel mounting holes. Loosely install two new fasteners.

NOTE: On IQ 121 and Switchback skids, verify the rear track shock pivot and brackets are rotated forward before attempting to collapse the rear torque arm.

3. Set the machine upright.
4. Install the remaining two new torque arm mounting fasteners.
5. Torque the rear suspension mounting bolts to specification.
6. Align the track guides/clips with the suspension rails.
7. Adjust the rear idler to achieve the correct amount of track sag.

©2010 Polaris Sales Inc.